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ACTINOMYKOSIS: A NEW INFECTIOUS DISEASE OF ANIMALS AND MANKIND.*

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THE progress of pathological research is continually demonstrating the mighty part played by microscopic vegetable organisms in the production of disease in plants and animals, generally leading to their destruction, and with more or less rapidity. The feeblest and smallest, as well as the largest and most powerful, are alike exposed to the ravages of these invading, relentless foes, whose attack is all the more destructive because it nearly always cannot be detected at its onset; and their extreme minuteness and tenuity, as well as their insidious and obscure manner of operating, are also so many barriers to timely recognition and protective measures against their assaults.

The immense destruction caused by minute parasitic fungi upon cereal and other useful plants, is only too often experienced by agriculturists and others. The mildew of the wheat, for instance, arises from the attack of a small fungus—the *Puccinia graminis*. When this little pest becomes multiplied to a great extent, it gives rise to most serious consequences. The disease called "Smut," attacking the flower of the wheat, is the produce of a minute parasite—the *Uredo segetum;* while the "Bunt," or disease involving the seed itself, is caused by another parasitic microscopical fungus—the *Uredo fœtida*—which, as soon as it

* A portion of this paper was read, and morbid specimens, drawings, and microscopical preparations exhibited, at the meeting of the Southern Counties Veterinary Medical Association, on October 30th, 1882.

enters the grain, completely fills it, and replaces the flour by a black, disgusting, fetid powder, consisting of minute balls, four millions of which may exist in a single grain. The disease which attacks rye and other grain, called "Ergot" or "Cock's-spur," is produced by a like minute fungus—the *Spermædia clavus;* that attacking the potato—the *Botrytis infestus;* that destroying the different species of Allium, as the onion—*Botrytis destructor;* and many other destroying fungi, whose existence in plants can only be realised by their ravages, and their presence by means of the microscope, are known to those who have made them a special study.

The lowest, as well as the highest animals, are similarly the victims of these almost impalpable organisms. There is not a creature, probably, which may not afford scope for their baneful action. The disease called "Muscardine," in the silkworm, is produced by the "balsoma" or *Botrytis Bassiana*, and several species of caterpillars are affected in the same way; indeed, some of these fungi of caterpillars completely transform the bodies of these into their own substance. Then we have the fungi which grow upon or within the bodies of man and wild and domesticated animals, and cause troublesome, very often serious, and only too frequently fatal disorders. The wonderful revelations which have been made by means of the microscope, lead us to believe that those diseases which are included in the group designated "zymotic," owe their production to vegetable germs; and other maladies not comprised in this class have already been discovered to be due to these microphytes—for instance, Anthrax, Tuberculosis, Swine-plague, Rabies, Fowl-cholera, Leprosy, etc.

Yearly the list of diseases evidently due to *Microbes*, or "germs"—as they are commonly designated—is added to; and whether these germs consist of simple forms, such as special *Micrococci* or *Bacilli*, or more complex organisms, yet by culture and inoculation-experiments their part in the pathogenesis of certain maladies can be no longer doubted.

Whether these fungi invade plants or animals—whether they attack the simplest or the most complex organisations—the tendency of their action is always the same—degeneration and disintegration.

The object of this paper is to bring to notice another addition to the list of microphytes which prove to be veritable scourges to animals, and are productive of loss to the community.

For the last two years, the pages of the VETERINARY JOURNAL have been more or less occupied with the descriptions and discussion of a disease chiefly affecting bovine animals, more particularly those of a juvenile age, and which has been by the majority of writers designated "Tubercular Stomatitis," evidently from the character of the lesions and its chiefly affecting the mouth; while by a few it has received other designations, and its tubercular nature has been denied.

The same malady has received some attention at other times among veterinary surgeons in this country, but nothing has been published as to its pathology.*

Though it is probable that two or more diseases have been included in this discussion, yet with regard to that which received the before-mentioned designation, there were some veterinary surgeons—myself included—who, for several reasons, were inclined to doubt its being allied to, or identical with, Tuberculosis; and as the question was one of some importance, from a sanitary and pathological point of view, an attempt was made to decide it by appealing to those practitioners who had the opportunity, to forward specimens of the disease to the Brown Institution for examination.

Several members of the profession obligingly complied with the request; but the only specimen which arrived in a satisfactory condition was the tongue of a steer forwarded in May last, by Mr. James, M.R.C.V.S., Thornbury, Gloucestershire. The animal from which the organ had been obtained was, as Mr. James subsequently informed me, one of five affected with this so-called Tubercular Stomatitis, the others having been successfully

* There are a few notes on what may have been this malady, by Professor Axe, in the *Veterinarian* for 1877, pp. 605, 759, but they are merely quotations, and throw no light whatever on the disease. Up to the present time, the views entertained with regard to it are fairly represented in the opinion of the late Professor of Cattle Pathology at the Royal Veterinary College, who, in the course of some remarks on what would appear to have been a case of this affection, and which was designated "Schirrus Tongue," states that "the causes of Schirrus are obscure, but they are evidently of a *constitutional nature*, as the disease is generally insidious in its attack, gradual in its development, and fatal in its consequences."

submitted to surgical treatment. The steer had not received much attention—the tongue having only been dressed a few times—as it was a two-year old animal, and the owner thought he would rather have it slaughtered before it lost condition.

The tongue was in good preservation when it reached the Brown Institution, and when I saw it an examination had been made of it by Dr. Roy, director of, and Mr. Garside, M.R.C.V.S., then veterinary surgeon to, that valuable establishment. The appearance of the organ was somewhat curious and very unusual, and it was evident—almost at a glance—that it was affected with something very different to Tuberculosis. In the first place, it appeared to be considerably increased in size, and in texture it was very dense; indeed, the term rigid might have been appropriately applied to it. A transverse section through its middle third exhibited the muscular tissue pale in colour, its fibres indistinct, and looking as if undergoing degeneration; while interspersed closely throughout the entire mass were myriads of small, light yellow, dense nodules, rather firm in consistence, for the most part perfectly distinct from each other, and varying in size from the dimensions of a pin's head to that of a millet seed or filbert. Here and there two or more of these nodules had evidently coalesced to form larger masses, and the section already mentioned had been made through a somewhat extensive patch, which looked as if in process of softening, and the tissues immediately surrounding it were ulcerating. This softening mass, which was somewhat caseous, might have been mistaken for tuberculous deposit; but to those who are familiar with the lesions of Tuberculosis, it would have been scarcely possible to make such a mistake in this instance, after a careful inspection of sections in different parts of the organ.

Mr. Garside had made the following notes with regard to it:

"The tongue weighed eleven pounds (5994 grammes). About seven inches from the tip it becomes suddenly enlarged. The enlargement extends to the fauces, and is hard and firm to the touch, resembling cartilage in consistence. Length 8 inches, depth 5 inches. The surface shows variously-sized ulcerations, not very deep, and looking as if punched out. In some parts the mucous membrane is purple in colour, mottled by the

presence of still darker spots, which look like blood extravasations. The thickening does not feel nodular, but uniform ; and it is evident that the mucous membrane is thickened by infiltration of the submucous tissue. On making a longitudinal section of the enlargement, it is seen to be pale in colour, inclining to a yellowish-red. Scattered throughout are a number of nodules, varying in size from that of a pin's head to a hazel nut. Some are isolated, others in groups of two and three. They project above the cut surface. They are white in colour, and their margins are generally well-defined. In some instances they are surrounded by a capsule of connective tissue. Although present throughout the whole of the section, they are far more numerous towards the surface of the tongue, being contained within a zone of an inch and a-half from the surface. They are of all shapes, but the smaller ones are mostly round. The nodules are also contained in the submucous tissues.

"In addition to these projecting nodules, are a number of variously-sized white patches, generally streaky, which look like hypertrophied intermuscular connective tissue. The nodules are also scattered throughout the muscular tissue. On the under surface of the tip of the tongue, there is seen through the mucous membrane a patch made up of yellowish nodules."

Mr. Garside's microscopical examination of the nodules at first led him to consider them crystals—a mistake easily made.

If the disease affecting this tongue was not Tuberculosis, then the question arose, What was it? Mr. James, who had sent the specimen, had in his communications to the VETERINARY JOURNAL, spoken of it as a somewhat common, and certainly a very serious malady in his district, among calves and young bovine stock, though adult animals did not escape its ravages. It was, therefore, of great moment to discover its nature.

As I have already said, Mr. Garside, from the density of the nodules, at first thought they were crystals, and calcareous in composition, and accordingly tested them with acids, but he concluded they were not composed of lime salts.

With much care, and after the exercise of a considerable amount of patience, it was subsequently found by Dr. Roy and Mr. Garside that the nodules were found to offer a definite

structure under the microscope, and when the higher magnifying powers of the instrument were employed, the presence of a peculiar minute fungus was detected, the mycelium developing, or being arranged in, a novel manner, each nodule being mainly constituted by a cluster or conglomeration of fungi or fungus elements, differing in arrangement and appearance from anything hitherto noted among entophytes infesting animals.

This was recognised as the *Actinomyces*, a fungus which has been discovered in certain morbid conditions of mankind and animals in Germany and Italy.

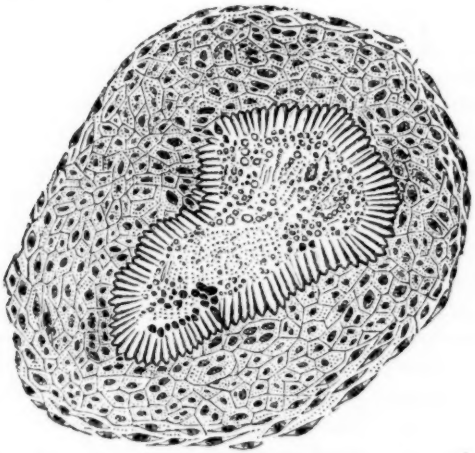

FIG. 1.—A cluster of *Actinomyces* tufts in the centre of a stratum of cells. From a nodule in the cow's tongue.

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Mr. James has quite recently, at my earnest solicitation, forwarded three additional specimens of the disease—portions of two heads, and a tongue. I shall notice the former first, as they are the most interesting and important, and give the clinical history of the cases, for which I am also indebted to Mr. James.

XUM

The specimens were two bovines—a steer and a heifer—eac about a year and a-half old. The heifer was first attacked about three months before. The symptoms were: swelling of the upper lip and nose, and the appearance of a "red place" about two or three inches from the anterior nares—this place resembling a *boil* on the human skin. Some dressing was sent, and this was applied two or three times a-week. Mr. James did not see the animal again for two or three weeks, when he was requested to inspect it again, as it was very much worse. He found the upper lip much more tumefied and very hard, and the disease extending up the nasal chambers, the little masses or "tubercles" being very characteristic. On his next visit he observed that the disorder had been checked, and it was kept in this condition for about a month. It then began to extend again, and all efforts to overcome it were fruitless. Dressings appeared to have no effect on it, and there was great difficulty experienced in properly syringing the nasal cavities. From this time the malady continued to gain ground, the growths developing so rapidly as almost to fill the nostrils. The animal was greatly distressed in breathing, throwing up its nose, and snorting and roaring in its efforts to respire. It was destroyed. Neither mouth or tongue was involved in this case.

A few weeks after the heifer became affected, the farmer requested Mr. James to see a steer as quickly as possible, as it had the same disease, and he was afraid his other stock would be involved, particularly the milch cows, in the "distemper." On examination, Mr. James discovered the roof of the mouth to be the seat of the malady, the greater part of it being "abraded." The nose did not appear to be implicated then, nor for some time afterwards. The disease yielded to treatment, and rapid progress was made towards recovery. But soon it attacked the upper lip and nose, precisely as in the other case, though not so seriously. This animal was killed at the same time as the heifer, the owner being afraid his cows would catch it.

These animals, with several more, had been sent away from the home farm to graze on some poor undrained land. The specimens, when they arrived in London, were found to have been much mutilated by the butcher. The nasal bones

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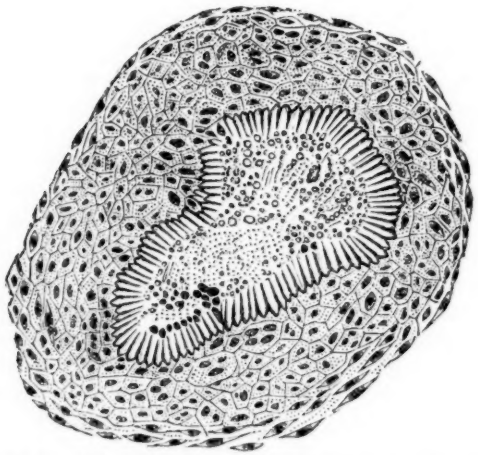

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These animals, with several more, had been sent away from the home farm to graze on some poor undrained land. The specimens, when they arrived in London, were found to have been much mutilated by the butcher. The nasal bones

had been removed from one head, and only the superior maxilla, pre-maxilla, turbinated, ethmoid, and palatine bones remained. The mucous membrane lining the nasal fossæ and covering the turbinated bones, was studded by various-sized, light-yellow, isolated little masses, like warts or small raspberries in outline. During life these nodular-looking bodies must have greatly obstructed the breathing. The only portions of the other head sent for inspection were the nose and the upper lip. The latter was much thickened and indurated, and small shot-like masses could be felt through the mucous membrane lining it.

The tongue specimen was from a two-year old steer. The anterior part of the organ, to an extent of five or six inches, was extremely indurated, and numbers of the yellow nodules, small in size, were scattered through the submucous and muscular tissues. This case was a very mild one of the disease.

A microscopical examination of the nodules from the mucous membrane of the nose, by Mr. Batt, M.R.C.V.S., the Brown Institution, revealed the existence of myriads of the vegetable organism designated *Actinomyces*, each nodule or mass being made up of a number of smaller nodules, these individually containing nests of felted fungi. Each cluster of the *Actinomyces* had the characteristic daisy-like outline and radiating lines springing from a somewhat dark centre, which will be hereafter alluded to, and which was such a marked feature in the specimens found in the first-described tongue.

These specimens, then, exhibited the same characteristic fungus elements and pathological features as the tongue, and leave no doubt whatever as to the nature of the malady which is reported to be so widely prevalent in Gloucestershire, and, from report, in other parts of England, as well as in Scotland and Ireland, and prove its non-identity with Tuberculosis.

The great importance and interest which attaches to this disease, have, therefore, induced me to bring it to the notice of the veterinary and medical professions in this country, as its nature has not hitherto been suspected, though by various names it has probably been known as a destructive disorder among cattle and other animals from time immemorial; and though its presence has not hitherto been signalised in our own species in these

islands, yet that it may not unfrequently occur there is every reason to believe, when we now know how prevalent it is among our cattle, and that cases affecting mankind have been recorded in Continental medical literature.

HISTORY.

As already stated, so far as the pathology of this malady is concerned, it is a new disease, as until its histological characters were discovered, we were in ignorance of its nature. For a very long period, and especially in Germany, it had been observed that the ox tribe was affected with a certain disease, or diseases, of the bones and soft tissues of the head, which received various popular names by agriculturists and dairy people, whose cattle were so frequently victims to it. In Germany the disease of the bones was known as "Ladendruck," "Ladengeschwulst," "Dicker backen," "Krebsbacken," "Bäckel," "Kimbeule," "Kiefergeschwulst," "Knochenkrebs," "Knockenwurm," "Winddorn," etc.; while when the tongue or other soft tissues in the mouth were specially involved, the terms "Holzzunge" (wooden tongue), "Hohlgeschwulste," "Schlundbeulen," "Wurm," etc., were applied.

Among veterinarians in Germany, the disease of the bones was looked upon as Osteosarcoma, Spina Ventosa, bone Tuberculosis, Osteoporosis, Hyperostosis, etc., while the tongue affection was supposed to be Tuberculosis, chronic interstitial Glossitis, tongue degeneration, Sarcomatosis, etc., the affection in other soft tissues being considered either as lymphomatous, fibromatous, scrofulous, or scrofulo-tuberculous.

In Italy, where the disease appears to be very prevalent, especially in the plains of Ferrara and in the Maremme of Tuscany, it was popularly considered to be a kind of Glanders and Farcy of bovines, sometimes looked upon as tuberculous, and when affecting the tongue was named the *Mal del rospo* (*rospo*—toad), *Trutta* (thrush), or Tuberculosis of the tongue.

In this country, as already remarked, the disease undoubtedly exists, and in all probability widely and frequently; though its pathology has not hitherto been ascertained. Under the designation of Scrofula, Tuberculosis, Tubercular Stomatitis, Miliary Tubercle, Schirrus tongue, Glossitis, Osteosarcoma, Osteoporosis, and many other names, there is every reason to think that this

disease has been included in the descriptions of these various affections.

In 1877, Bollinger* drew attention to a disease of cattle which, he asserted, was not unfrequent among them, and which consisted in a kind of new-formation tumour, that appeared on the upper or lower jaw, in the alveoli of the molar teeth, or sprang from the spongy tissue of the bones, displaced the teeth, and in growing invaded and destroyed the healthy tissues,—bones, muscles, mucous membrane and skin, appearing externally, or in the mouth or palatine sinus. The bones, when macerated, looked like pumice-stone, modified through central osteoporosis and external hyperostosis. After some time the round, conglomerate, luxuriant growths generally became puriform or ichorous, and ulcerated, producing abscesses and fistulæ, and sometimes increased to the size of a child's head. The progress of the disease was gradual, and interfered with mastication when it had advanced to a certain stage; this led to emaciation, and to prevent loss from this cause the owners of the cattle generally had them destroyed before this stage was reached. In examining fresh tumours, Bollinger discovered (in three cases) amongst the dense connective tissue, conglomerate masses or nodules of various sizes, from that of a walnut to a hen's egg, of soft consistence, pale yellow colour, and moist appearance, which on section showed a turbid, whitish-yellow puriform contents; or the nodules were of a spongy texture, in the fine stroma of which were numerous spaces about the dimensions of a hemp-seed, containing a dull-yellow, thick, or cheesy-like substance. In scraping a section of an old or young nodule, this substance was easily removed. Microscopically, the tumours appeared to be composed for the greater part of old or embryo granulation tissue, which had a kind of sarcomatous structure, while the cheesy substance consisted of pus-corpuscles, granulation and granular cells, as well as fatty granular *detritus*; in addition, the latter contained innumerable, various-sized bodies, which were opaque, of a faint yellow tint, often somewhat mulberry-shaped in outline, and here and there encrusted with lime salts. This was recognised as a real fungus, but at first

* References will be found at the end of this paper, when treating of the literature of the subject.

no pathological importance was attached to its presence, and the disease was simply named "jaw-osteosarcoma."

Besides this noteworthy form, which appeared to have its origin in the invasion of the alveoli by the fungus, the tongue of the ox presented another form, proper to itself. Imbedded in the parenchyma of the organ, Bollinger found a greater or lesser number of nodular-looking bodies, the majority of which were as large as a millet or hemp-seed, and some as big as a cherry or walnut; many stood prominently from the surface of the mucous membrane. When fresh, they were mostly white or greyish-white, diaphanous, moist-looking, very soon becoming turbid or undergoing puriform softening, and vacating their connective tissue capsule. When these nodules were on the upper surface of the tongue, destruction of the mucous membrane, erosion, ulceration, and cicatrization took place; while in the parenchyma of the tongue, a secondary interstitial Glossitis became developed, when there was partial atrophy of the muscular fasciculi, and a marked enlargement and wood-like induration of the organ.

The disease, when in the jaws, was not uncommon in old cattle, developing itself in a few weeks, and was nearly always incurable; the animals would survive for a month, or even a year, until the difficulty of eating, because of the diseased jaw or enlarged tongue, produced emaciation and debility, and the animal was slaughtered. In the nodules of the tongue, as in the jaw, the microscopical fungus was constantly present.* That the tongue disease was not rare, was evidenced by the fact that in one year Bollinger had no fewer than six specimens sent to him from various parts of Bavaria; while in five preparations he had in spirit, he found the fungus. He not only discovered this fungus in the centre of the nodules, but also in the submaxillary lymphatic glands of the tongue, as well as in the tracheal lymphatic glands. He found these glands greatly enlarged, and studded with grey and dull-yellowish spongy nodules, in the interior of which he found immense numbers of the fungus. The fungus was likewise discovered in a series of new-formation tumours which cows are very liable to, in the

* These organisms had been observed for several years (1870) by Professor Hahn, of the Munich Veterinary School, but he had not attached sufficient importance to them.

XUM

pharynx and larynx, as well as in the mucous membrane of the stomach. In the two former situations, these tumours appear as polypi and submucous new formations, and these had received such names as Lymphoma, Throat-tumour, Fibroma, Tuberculosis, Scrofula, etc.* In all these tumours (ten of which he had preserved in spirits of wine), the section was always more or less of a spongy character, and when the puriform or cheesy matter contained in the numerous small interspaces of their structure was examined microscopically, enormous quantities of the same endophyte were found as had been discovered in the jaw tumours and the so-called "Wooden-tongue."

Besides all these, in the tumours of cattle which the German farmers and dairymen named "Throat-boils" (*Schlundbeulen*), and which appear in the vicinity of the parotid gland, larynx, and pharynx, and apparently have some relationship to the jaw tumours, the same nodules and organisms are found; they may be derived from the lymphatic glands in their neighbourhood. In a case of supposed Fibroid in the second compartment of a cow's stomach, the tumour being about the size of a man's fist and of a spongy nature, the fungus was found by Bollinger; as well as at the base of a gastric ulcer which was mistakenly supposed to be of a tuberculous character.

In fixing upon this endophyte as the cause of the disease, through its destructive nature, and its tendency to produce new-formation growths (in this respect resembling the *Chionphye Carteri*, which causes the "Madura-foot" of the natives of India), Bollinger makes some remarks on the fungus, which had been carefully studied by the professor of botany at the Munich Veterinary School, Dr. Harz, who obtained it from fresh specimens. The fungus found in the tumours from cattle, form globular drussy tufts, from 0,11 millimetre in diameter. The majority of these tufts are aggregated in mulberry-shaped masses of from 0,5 to 1 millimetre in diameter, and appear to the unaided eye as very minute dull-white granules. Very frequently the tufts are somewhat calcareous, and then it is difficult to make out their composition; it is the same when they have

* Bollinger notes that in some parts of North Germany, five per cent. of the cattle are affected with these throat tumours.

become altered by lying for some time in alcohol. By a slight pressure made upon it, the fungus tuft is considerably altered in appearance, and mostly assumes the shape of a spheroidal segment, wherein some of the organisms can be distinctly traced throughout. The latter commence at the pointed end of the mass, with a somewhat cone-shaped base-cell, which may possibly represent the non-apparent mycelium, and which bears a large number of short-stalked hyphens. The end of the hyphen shows the Gonidiæ, which are, like the hyphen itself, polymorphous, and of an oval, globular, or elongated form. From the expanded end of the Gonidiæ are developed a number of young shoots or sprigs, and from each Gonidium arises an individual; so that a number of Gonidiæ together give rise to a mulberry-shaped colony; and this is the usual form in which the clusters of fungi appear, though sometimes here and there are found apparently stunted or abortive groups.

The fungus, in fact, is allied in many respects to the common green mould (*Penicillium glaucum*) which grows on jam, paste, damp leather, etc., and is therefore very far from being one of the lowest of the group to which it belongs. The individual plant, in reality, consists of a conical mass of branched filaments springing from a single cell, and bearing on their short terminal branchlets the spores or *Conidia*, by which the mould is produced.

From the radiating structure of this micro-entophyte, and its being found at first in the ox tribe, it was named *Actinomyces* (ἀκτίς, a ray, μύκης, a mushroom or fungus) *bovis*. This, Bollinger asserted, was the first instance in which a fungus belonging to the class of moulds had been found in the interior of animal tissues, such as the bones. The designation of Actinomykosis (mykosis—μύκης, a fungus) was given to the disease, following the example of previous pathologists—such as Alibert, who applied the term mykosis to the affection in mankind known as *Frambœsia* (the *Mulluscum contagiosum*, for instance, due to a vegetable parasite, and which he designated *Mycosis fungoides*).

Zippelius of Obernburg (Lower Franconia) informed Bollinger that, in the course of ten years, he had noted not fewer than 254 cases of Lymphoma in the vicinity of the larynx and pharynx, in addition to 157 cases of jaw tumours in cattle: and Bollinger

was of opinion that the majority of the first, and probably all of the second, were due to this fungus. Zippelius had also seen both forms of the disease in goats and swine, though much seldomer than in cattle. Veterinary literature also contained a number of cases of these tumours in goats and oxen; and Bollinger suspected that they would likewise be found to exist in sheep and other animals.

In other parts of Franconia, Professor Franck has found the tumours in the region of the throat so common, that among cattle owners, whenever an animal began to lose condition, it was said to have a "growth" (*gewächs*) in its throat. Even while Bollinger was writing his paper on the disease, he received a tumour from a veterinary surgeon in Pfalz, which was as large as a fist, and which he had removed from the pharynx of a two-year old bull.

For some time previously the animal could not eat, appeared to suffer great pain, coughed, and so rapidly lost condition that it had to be slaughtered. In the pharyngeal cavity this tumour was found just above the larynx. It was spongy in texture, and in the meshes of the fibrous framework was a puriform fluid containing the characteristic fungus in immense quantity. The spongy character of this granulation-tumour was so marked, that the unaided eye might have discovered its mykotic origin.

Bollinger's observations attracted much attention on the Continent, and as I have already stated, I gave a brief abstract of them in the VETERINARY JOURNAL for 1879 (Vol. VIII. p. 256), with the view of discovering whether the disease had been noticed in this country.

Their publication in Italy elicited the fact that Professor Rivolta, of the Turin Veterinary School, had already published a paper in the VETERINARY JOURNAL of that city, so long ago as 1868, on a sarcomato-fibrous tumour on the lower jaw of an ox; and after that date, in 1875, Professor Perroncito, of the Turin Veterinary School, had an article in the "Enciclopedia Agraria Italiana," on "The Osteosarcomata of the upper or lower jaws of cattle," in which he describes, among other microscopical objects found in the round and giant-cell sarcomata, cryptogamic bodies in conglomerations, which were made more distinctly visible by treating them with dilute hydrochloric acid, which dissolved the

lime salts surrounding them. According to Israel, Langenbeck, the famous German surgeon, had, years previously, described and delineated the fungus, which he found in the pus from a deep-seated vertebral abscess in a man in the hospital at Kiel; but some doubt is thrown upon the correctness of this statement.

In 1875, Rivolta undoubtedly described the structure of the nodules very accurately, and pointed out that the vegetable organisms were not crystals, but minute fungi, which were not soluble in water, alcohol, solutions of potass, or sulphuric or hydrochloric acids, etc.; the nodules were, in fact, discoid tufts (*cespugli discoidi*), composed of branching rods; these tufts were of unequal volume, and the nodules were the size of a poppy-seed.

In 1878, Siedamgrotzky, of the Dresden Veterinary School, furnished conclusive evidence of the correctness of Bollinger's descriptions and conclusions. In multiple sarcomata from the mucous-membrane of the pharynx of oxen, as well as a tumour from the lower jaw of a cow, obtained fresh, he found the *Actinomyces* described by Bollinger; but he was unsuccessful in cultivating it, or inoculating animals with it. In the same year, Israel published a case of what he designated "Chronic Pyæmia," occurring in man, in which the fungus was found, and its identity with that of the bovine species was subsequently established.

After this date, several German and Italian veterinarians record observations, all more or less interesting; while sixteen cases are reported by medical men in Germany. These I shall again refer to. In the meantime I will briefly sketch the symptoms of the disease, and mention the different situations and animals in which it has hitherto been observed.

Actinomykosis of the Tongue.

I have already stated that in this country, when the disease is present in the tongue, it is supposed to be Schirrus, Induration, Glossitis, Tuberculosis, Cancer, etc.* Doubtless, all these morbid

* For instance, in Steel's "Diseases of the Ox" (p. 234), in treating of Cancer of the tongue, it is stated: "In this disease the organ is the seat of small nodules of carcinomatous deposit, which more or less replace the proper substance of the organ, and some of them bulge beneath the mucous membrane of the dorsum. Some undergo softening, and the submaxillary and parotid lymphatic glands are generally involved through absorption of cancerous matter. This disease progresses slowly, and materially interferes

states may exist without the presence of the *Actinomyces*, but I think I may be pardoned, from the specimens forwarded from Gloucestershire and the cases reported, if I ascribe the majority of the instances which occur of disease in the tongue to this microphyte. In South Germany, where interstitial Glossitis or Induration is very frequently reported, nearly all those examined have proved to be cases of Actinomykosis. I have no doubt whatever that it is the same in this country. Take, for instance, the description given by Captain Russell, F.R.C.V.S., and we shall find Actinomykosis of the tongue graphically delineated.

He writes, when treating of Induration of the tongue in the ox—a disease very common in his practice in Lincolnshire: "I have observed that the disease commences with small patches of a yellow colour, associated with thickening of the mucous membrane, sometimes on the dorsal surface, sometimes on the tip, and at others underneath the tongue, or on one or other of its sides. This thickening, in the course of a short time, breaks up into a number of small pimple-like excrescences, which soon become confluent. As the disease spreads, a cheesy deposit is thrown off, leaving a very red and angry-looking surface. Subsequently, the organ becomes hard and swollen, and eventually hangs from the mouth perfectly useless. The animal quickly loses the power of prehension and deglutition, and if not destroyed usually succumbs to inanition. I do not find that either constitutional or local treatment is of any avail. Four years ago my attention was called to several cases, and this season I have seen as many as twenty. The progress of the malady is generally slow, the increase in size of the tongue being gradual; but as it progresses movement of the organ is diminished, and mastication is performed with corresponding difficulty. There are rarely any indications of severe inflammation noted, and this fact should differentiate the disease from Glossitis, as should also the absence of the acute pain which marks the latter. Discoloration may be present here and there; indeed, this usually precedes ulceration." *(To be continued.)*

with the development of the animal. It is incurable, and the flesh of cattle thus ffected is not good meat, though always consumed. . . . . Some authorities consider this disease scrofulous rather than a form of Carcinoma."

THE EPIZOOTIC DISEASE AMONG BRITISH HORSES IN EGYPT.

BY J. J. MEYRICK, C.B., F.R.C.V.S., PRINCIPAL VETERINARY SURGEON, CAIRO.

[We have received the following interesting communication from our esteemed colleague in Egypt, with regard to the serious and very fatal epizoöty which appeared among the horses of the army of occupation immediately after the campaign. It will be noticed that the predictions we made in an editorial article in this Journal for September last, have been so far verified; and there can be no doubt that had active operations been continued for a few more weeks, the mortality would have been very great. As it is, the losses have been, comparatively, rather heavy. We would commend to Army Veterinary Surgeons serving in Egypt, perusal of the editorial article just referred to, in order that we may obtain trustworthy information as to the climatology and the animal diseases of Egypt. To account for the pernicious anæmia from which the horses suffer, we would suggest that the nematode worm—the *Ancylostomum duodenale*—be carefully looked for in the upper part of the small intestine, where it burrows into the mucous membrane, and produces in mankind the disease which has been designated "Egyptian Chlorosis." For reports on serious outbreaks of disease among horses in Egypt, see 'Animal Plagues,' Vol. I., year 1328; and VETERINARY JOURNAL, Vols. III., pp. 298, 364; IV., 431; XI., 40; XV., 177.]

LAST week I sent a small tin box, addressed to you, and containing bottles of blood from two horses which died here of the prevailing fever, together with bottles of the water which each of them had been drinking. The latter comes in pipes from the Nile, which, during the last few weeks, has been at its highest point, and is very muddy in colour until it is kept long enough to allow the sediment to fall. One horse died in the city of Cairo, and the other at Abassieh, a cavalry station with barracks four miles distant. I have instructed V.S. Clayton to send you some blood from Alexandria, for the fever has prevailed all over Egypt. During a *post-mortem* which he and I made there some weeks ago, we found a fine specimen of a blood tumour in the spleen. . . . I will also forward you some more bottles from here in a day or two, if the Post Office will take them without asking what the box contains.

The disease began at the latter end of September, with a few isolated cases, which were considered to be Bilious Fever caused

by continued exposure to the sun. The number of horses attacked increased rapidly during the second week in October, and did not begin to diminish until the first week in November, after which the disease declined in its virulence, and there have lately been very few fresh cases.

The rate of mortality was high, the horses having been brought, previously to the outbreak, into a state of great debility by the severe labour undergone in marching through the sand from Ismailia to Cairo, with a burning sun overhead. Syrian and other Eastern horses were not attacked in nearly the same proportion as those of English blood, and of the latter the under-bred showed less power of resistance to the disease than the well-bred. Mules escaped it altogether, unless two were affected, which died at Alexandria with decided symptoms of Anthrax. Among the horses there were, during the month of October, 306 cases and 78 deaths.

The disease appears to have prevailed throughout the cultivated districts from Cairo to Alexandria, and its exciting cause was, I have no doubt, miasma given off by the swampy soil during the rise of the river Nile.

The chief predisposing cause seemed to be the inhaling of emanations from animal excrement. All the stables in Cairo, whether belonging to the Egyptian army or to private individuals, are badly ventilated, and have floors saturated with urine. Horses placed in them, even for a few days, were affected in much greater numbers than those picketed in the open air. The latter were by no means exempt, and in one place a large proportion of them suffered; but the ground upon which they stood is in a very impure state, owing to its proximity to the city and barracks, and also owing to its having been used for hundreds of years as the encamping-ground of the pilgrims going to Mecca.

The first symptoms of the disease usually were: loss of appetite, with yellowness of the mucous membranes, petechial spots being often observed on them after the first or second day, and in some cases at the very beginning of the attack. The breathing was quick, and the pulse ranged from 60 to 80. In a very few cases there was a lymph-like discharge from the

nostrils, similar to that observed in the form of Anthrax, called "Loodiana Fever" in India. After the first day the appetite usually returned, more or less, and was frequently good, even in those cases which terminated fatally.

Death often ensued within two hours after a horse was first observed to be ill, but generally the fever lasted from three or four days to a week, either destroying the patient or leaving it in a state of debility from which it was a long time in recovering.

Some cases lingered for three or four weeks, dying at last in an anæmic state.

The *post-mortem* appearances varied considerably, but they resembled in many respects those of Anthrax in most of the animals which died after a short illness. In these were observed yellow clots and effusion of serum into the abdomen, patches of the red colouring-matter of the blood on the coats of the intestines or in the omentum, and sometimes enlarged spleen. In several instances portions of the heart were stained a dark purple colour. The liver was occasionally congested, but often apparently quite healthy.

In cases which lingered for some weeks nothing was found, as a rule, except pallor of the membranes, with sometimes a friable liver.

The most important part of the treatment consisted in careful nursing and supplying plenty of pure air. Horses which were very ill in their stables, often recovered rapidly after being tied out of doors under a tree; but, unfortunately, shade of that description was not plentiful, and exposure to the sun added to the difficulty of cure.

Medicines appeared to be of little use, not even excepting Carbolic Acid, which seems more beneficial than any other remedy in Loodiana Fever. Better results followed the administration of salines, such as Nitrate of Potash or Carbonate of Soda, than of anything else; supporting the patient's strength after the first few days with diffusible stimulants and nourishing food.

A SIMPLE TOURNIQUET.

BY A. METHERELL, M.R.C.V.S., BRIGHTON.

I DESIRE to commend to those members of the profession who operate much upon the extremities, the above appliance, which I do not find in veterinary instrument catalogues. In principle it is not new to the medical profession, though dissimilar in its most essential detail.

So simple is its construction that it can scarcely be called an instrument, consisting merely of eighteen inches of solid small india-rubber rope, known to the trade as "round cord." A hook and thimble are attached at opposite ends.

The *modus operandi* is simply to wind this ligature as tightly as possible, three or four times, round the limb, above or below the knee or hock. No sponging is required in most cases, and in none is there more than the operator can conveniently manage himself. Should an artery be severed, no immediate inconvenience arises, as it can be tied with the greatest possible facility, and without appreciable hæmorrhage.

The merits of this compress are: its complete efficacy, its extreme simplicity, and, above all, its cheapness. I am unacquainted with the one devised by Mr. Field, and supplied by Messrs. Arnold at fifteen shillings; but I know it cannot be more efficient than this one, which I trust will be sold for a mere trifle. It cost me two shillings, and is practically indestructible; but of course it has not Arnold's finish. In these days of depression in general, and in agriculture particularly, most veterinary surgeons will welcome cheap and effective instruments.

NOTES ON THE TEETH OF THE CAMEL, AS INDICATIVE OF AGE.

BY G. A. OLIPHANT, F.R.C.V.S., ARMY VETERINARY DEPARTMENT, INDIA.

I HAVE not, so far, been able to ascertain definitely the course of dentition in very young animals; but have succeeded in obtaining correct data to guide selection from two years and upwards,

which will prove, for all practical purposes, sufficient—the youngest age at which camels ought to be taken for the service being six years.

Leaving out of consideration the molars or back teeth, which have but little interest with regard to the judging of age, the camel of full age has in the lower jaw six incisors, or front teeth, and two tushes, or canine teeth, occupying the usual position, as in the horse, etc., immediately posterior to the third pair, or corner, incisors or nippers. As in the cow, etc., there are no incisors in the top jaw, their place being occupied by a tough pad; but there is a well-developed canine tooth, corresponding with that in the lower jaw, on either side, and, in addition, two smaller teeth of the same description (one anterior and one posterior to each of those already described), and which, for the sake of easy description, I will designate the secondary canine teeth; the central ones and those in the lower jaw being called the principal. The full mouth of teeth, therefore, consists of six incisors and two canine teeth in the lower jaw, and six canine teeth in the upper.

As in other animals, there are two distinct sets of teeth—the milk teeth in the young animal, which are ultimately shed, and replaced by the permanent set. The difference in appearance between these two sets of teeth as to size, shape, etc., is so marked, that the most casual observer may learn to distinguish them after the inspection of a very few mouths.

Starting, then, at two years of age, the animal will be found to have six incisor teeth in front, and one canine tooth on either side in the lower jaw, and one canine tooth on either side in the upper. All these teeth are of the temporary or milk class. The incisors, small, white, chisel-shaped, with sharp edges; the canine teeth, small and pointed, the upper ones especially so.

At three years of age the incisor teeth have become blunt on their edges, the extent of wear decreasing from the centre pair to the corner teeth, of which the cutting surfaces are still tolerably fresh.

At four years of age the incisors are much worn down, fully to half their length; presenting, instead of the flat, chisel-shape,

the appearance of a set of round pegs, set wide apart in the jaw, and are much discoloured. This wear increases up till nearly five years of age, when the temporary teeth will be frequently found to be worn quite down to the gums. The mouth at this period might appear to the uninitiated to be that of a very old animal; but the smallness of the remains of the teeth, and more particularly the absence of the powerful tushes seen in the older mouth, will readily mark the difference.

At about five years of age the first permanent incisors are cut, and a series of very marked changes commences in the mouth. Two large, broad, chisel-shaped teeth spring up in the front or centre of the lower jaw, and speedily grow to a considerable length, showing a very marked contrast to the remaining portions of the temporary teeth. The animal is now described in the vernacular as *do uk*, having been previously known as *chatri*.

At about six years of age the second pair of incisors appears, one tooth on either side of the centre pair, and the camel is known as *chowga*.

At seven years of age the last, or corner, incisors are cut, and the title *chiga* is applied.

Between seven and eight years of age the tushes in the lower jaw are cut, quickly followed by those in the upper. At about eight years old these canine teeth have attained a length bringing them fairly on a level with the incisors, and the latter named are fully up, level with each other, the centre pair showing signs of wear on their cutting surfaces; the second also, but in less degree; the corner pair being quite unworn. The camel is now described as *nesh* or *jewan*, and may be considered in its prime.

The two secondary tushes on each side of the upper jaw are cut after this date; but I have as yet been unable to fix the exact period, and, from a considerable number of observations, I am inclined to think that they are somewhat irregular in their time of appearing.

Increasing age is marked by the wearing down of the incisors, the cutting surfaces becoming more and more blunt, contracted from side to side, and wider from front to back, until, in the very old animal, they become, as in the four-year old, worn down to mere stumps. The principal pairs of tushes increase gradually

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in length, and, from holding a position somewhat sloping forward in the mouth, get upright, and, especially in the case of the upper ones, eventually curve backward. In very old animals the tushes are worn by friction against each other. Another description of wear in the incisors is also seen in animals between three and four years of age, and also after eight years of age; that is, when the temporary and permanent teeth are respectively beginning to show wear. There is an indentation of the sides and tops of the teeth, caused possibly by friction in the act of jerking the head, to break off foliage in browsing.

It will be seen that, at one period of the animal's life, namely, four years to five years of age, the mouth is almost devoid of teeth; and from that to full six years of age, when four teeth are fully established, there must be considerable difficulty in gathering food, this being increased by the tenderness of mouth caused by the cutting of the permanent teeth. It is at this age, when, it may be reasonably argued from our knowledge of other classes of animals, the camel is most subject to disease and as little fit for physical exertion as at any period of its life, that large numbers are purchased; and I can, from personal observation, vouch for the fact that very many of those which have died in Afghanistan were of this class.

ANTHRAX IN CACHAR AND MANIPUR, INDIA.

BY J. GRIFFITH EVANS, M.D., ARMY VETERINARY INSPECTOR, MADRAS.

(*Continued from page* 383, *vol. xv.*)

24. *Ponies running loose have the Disease as much as those in Stables.*—Though on general sanitary principles too much attention cannot be paid to keeping the stable floors dry and clean, yet I have failed to find in Assam that Anthrax is more common in stables with bad flooring than in stables with good flooring; and it certainly affects the ponies which run loose unstabled quite as much, and more according to the best information I have received, than those which are stabled. The statistics received from the tea gardens, already referred to in

paragraph fifteen, show that the disease is about three per cent. more fatal among the ponies which are allowed to run loose on the alluvial plains unstabled than among the ponies of Europeans stabled on the tops of the porous hillocks and plateaux. The Resident at Manipur states that the soil of that valley throughout is a clayey loam, that the disease appears in all parts of it, and that it appears equally among stabled and unstabled horses (*vide* paragraph 1, C and D). The Manipuris residing in Cachar and at Gauhati, who know much more about horses than other natives, and whom I repeatedly cross-questioned upon the subject, all declare that the disease does not attack those in stables more than those running loose; but, as one of them remarked, if several ponies stand near each other, whether under cover or in the open, if one of them gets the disease, they are all most likely to get it within a few hours. I have already mentioned that the only stable out of the five situated close to the river at Gauhati, in which the disease appeared, and where four have died of it, is the only one in the station that is not on alluvial soil (*vide* paragraph 19).

25. I conclude, therefore, that the disease in Cachar and in the Brahmaputra Valley, as well as in the state of Manipur, is not due to what the Principal Veterinary Surgeon thinks is the chief cause in Bengal.

26. *Emanations from Swamps.*—In Europe the cause of the disease is believed by many to be some emanation from swampy ground, and conveyed in the air either with the dust, or the dew, or the fog, and sometimes to a considerable distance from where it was generated, and also that it enters the system by the lungs. This opinion gains support by circumstances found in Assam, the swamps in the neighbourhood of places where the disease prevails, and the sudden way in which it is rapidly extended over wide regions in "epizootic years," etc. If the cause of the disease emanates from water to the air, it is obvious that it may be taken into the stomach by drinking that water, and pass from the stomach with the water into the blood, unless the walls of the alimentary canal, like a filter, prevent it. This question, therefore, deserves serious consideration.

27. *The Bacillus of Anthrax and the Common Bacillus.*—It is

very probable that the Bacillus of Anthrax is indigenous in some localities before domestic animals go there to be affected by it, and that it becomes more virulent after cultivation in certain fluids than it was before. Rodent animals are much more subject to the disease than horses and cattle, and it cannot be doubted that dead rodents help to spread the infection. A Bacillus, undistinguishable by the microscope from that of Anthrax, readily developes not only in stale urine, as stated in paragraph twenty-two, but also in many organic infusions under favourable conditions, and it is often found in impure well water; but it has not been proved to be the cause of disease when transferred into the veins of a living animal. Whether it may acquire the virus of Anthrax if cultivated in a way not yet discovered, no one knows, though some believe it may; and that the *Bacillus Anthracis* and the common Bacillus are essentially and organically the same, the only difference being an acquired virus. Possibly future researches may prove it to be so, though probably not. If the large edible and poisonous fungi were as small as the Bacillus, they could not be distinguished by the most powerful microscope. Recent researches have proved that the Bacillus of Anthrax may be deprived of its virus by a certain method of cultivation, though its propagating powers remain apparently unimpaired, but it recovers its virulence again when it is transferred to favourable soil. Present indications tend to show the Bacillus of Anthrax is much more commonly distributed in every quarter of the globe than was formerly supposed, and, like other fungi, it occasionally increases in numbers, and perhaps in virulence also, to an incalculable extent, owing to some modifications in the laws of its life with which we are not acquainted. As a rule only one out of many millions of the spores of the common large fungi finds a suitable soil and conditions for growth and development to maturity, the others being all destroyed by natural agencies, which is a very merciful providence for which we cannot be too thankful. Such is the case, doubtless, with the Bacillus and other microscopic fungi; and perhaps the cause of their increase in "epidemic years" may be a suspension or decrease of the natural elements which usually destroy them, as well as an

increase of the fluids most favourable for their nourishment. It is very remarkable that the disease disappears every year from Cachar at the commencement of the rainy season, no matter how bad it has been up to that time, and it will not recur in that district before the next dry season. The rains are ushered in at Cachar by very violent thunderstorms, worse, I am told, than in any other part of India ; and it is worthy of consideration whether the ozone liberated by the lightning has any share in the natural process of checking the disease. Of course the rain itself has much to do with the life-history of microscopic fungi, which find a more favourable soil for development in stagnant water exposed for a long time to the sun, and allowed to dry up slowly, such as is common throughout India at the close of the dry season. I shall recur to this again when I come to consider the drinking water.

28. *Infection more readily taken by the Lungs.*—Recent researches have also proved that the spores of the Bacillus pass into the system much more readily when breathed in a dry state into the lungs than when taken into the alimentary canal with food. Rodent animals, which are the most subject to Anthrax, may eat the infected flesh and blood mixed with food with apparent impunity, *provided there is no abrasion of the mucous membrane lining the alimentary canal.** If after being so fed for some time a rodent be killed, and the contents of its intestines be dried and afterwards finely pulverized, and then inhaled by another rodent, the latter will take the disease and die in a short time, with the Bacillus swarming in its blood. This shows that the spores retain their virulence in the intestines, and pass through without doing harm to the animal that ate them ; and it also confirms the opinion which I expressed in my last letter to you, No. $\frac{B}{19}$, of the 3rd ult., paragraphs 11 and 12, that jackals and vultures and crows, etc., feeding on the carcasses may sow the spores broadcast with their droppings, and thus spread the disease.

29. *The Virus conveyed by the Atmospheric Currents.*—In the dry season of 1878-9 the disease destroyed most of the ponies kept on the porous ridge at Silchar, and none of those kept on the

* *N.B.*—Horses have slight sores on the gums and lips from the bit, etc., much oftener than suspected.

retentive alluvial clay near the river Barak got the disease; but in the following year it was reversed, for nearly all the ponies kept by officers on the riverside died of the disease, and none got it on the ridge. This, I think, can be accounted for only by the supposition that the virus travelled in the air, and its path happened to be directed by currents along the ridge one season, and along the riverside another season. I could find no difference in the food and water to account for it. This year both the civil line on the ridge and the military line on the riverside has escaped.

30. *Instructive Cases.*—The two cases which I had the opportunity of investigating *post-mortem* at Burkola Tea Gardens are very remarkable. The pony belonging to the manager was found dead in the stable in the early morning of the 27th January last, and the one belonging to the native employed on the garden was found very ill at dawn, and died about 10 a.m. the same day. The manager's pony was with five others in a stable made of bamboo, well ventilated, the flooring raised, in fair order, situated on the edge of a porous plateau, about 225 feet above the clay fields of the plain. The side of the plateau is very steep, allowing good drainage. The surroundings were clean. The drinking water was good, obtained from a "pucka" well very deep in the sand, and walled round at the top. The grass would pass as excellent doob in any regimental stable in Bengal; it was obtained from the sloping side of a river, washed and dried, the same as what the ponies belonging to this garden had been having in the cold season for the past nine years, and they always did well upon it, though the ponies of the other gardens on the plateaux north of the Barak, with few exceptions, got no grass from the riverside, but from the roadsides on the uplands. This pony was seven years old, in good condition, had not been off the sandy plateau for months, except once or twice a week to the target range, where he was always led by a syce or else tied to a tree. He was never allowed to eat grass or drink water there, not from any suspicion of danger, but because there was no necessity. The ponies of other gentlemen, coming from a longer distance to the target, were often let loose during the practice to graze and drink, and were not apparently the worse for it. The pony belonging to the native was turned

loose every day on the rice stubbles of the alluvial clay, at the foot of the tableland, with the ponies of other natives, when he drank swamp water, or river water, as he pleased. At night he was usually tied somewhere near the hut where the owner lived, on the clay land at the base of the plateau, about three-quarters of a mile from the stable of the manager's ponies, but never under cover. These two ponies had not been in each other's way, I am credibly informed, for many weeks; they were thus exposed to entirely different sanitary conditions, and yet they got the same disease, and died about the same time, all the other ponies on the estate escaping. This strongly reminds one of those sporadic cases of Cholera which occur about the same time at different ends of the same station, in people exposed to entirely different sanitary conditions, with regard to houses, food, and drink. The only possible explanation, I think, is in the fact that the atmosphere is a common medium by which infected particles scattered in it may enter the mouth and nostrils of persons distant from each other, while individuals near them may escape. These infectious particles are not visible to us when they are transported in the air, and, therefore, we are puzzled by their operations; but if we watch how larger objects, such as thistle-down, are scattered by aërial currents, we shall learn a useful lesson with regard to the spread of infectious particles.

31. About two months before the above ponies died, the pony of the Baboo doctor on the estate was found dead one morning, though he was supposed to be well the previous evening; he was running loose in the rice-fields of the lowland, like the ponies of the other natives. That pony was bought by the Baboo about a week previously, at some place distant, but I could not learn where. No one knows what that animal died from, but there is reason for suspecting it was Anthrax, since the other ponies died of that disease so suddenly, and, if so, it is almost certain that he imported the disease to the garden, for Mr. Ferguson, the manager, who has been there nine years, assures me that during that time no animal died on the estate of the disease in any of its forms before these cases.

32. *The Doob-Grass.*—At Silchar I found several gentlemen attributed the disease to the doob grass commonly obtained there

from the sloping banks of the river, which deposits very filthy matters on the shore as the water lowers when the dry season advances. The soil is dug up with the roots of the creeping stem, and though it be beaten off, and the grass washed in the river, and then dried before it is taken to the stable, it is never absolutely clean, though it would pass as good in any regimental stable in Bengal. There can be no doubt that if the grass were obtained from the spot where the virulent Bacillus of Anthrax flourished, it would be very likely to convey the poison ; and, moreover, when we know that dead carcasses are thrown into the river by natives, which may be seen to rot on the banks, we are warranted in believing that in some instances the virus of the disease is conveyed in that manner, for it is likely enough that when the carcass of an anthracoid animal is exposed this year, the grass-cutters will be rooting up the doob for ponies next year. But, nevertheless, if that be a cause of communicating the disease, I think it is extremely uncommon.

33. The fact of some gentlemen having lost no ponies since they ceased to get grass from the riverside, whose ponies died of Anthrax previously, is no proof that the grass caused the disease ; nor is the fact of many more having never lost a pony, though they always got grass from the riverside, a proof that there is no danger in using that grass. On the plateaux north of the Barak, doob from the riverside is not easily obtained, and, therefore, is never used except in a few places, but Anthrax appears to be as common there as on the south side. North of the Barak, doob is almost always got from the dry ground on the roadsides. In the Brahmaputra valley ponies die of the disease which are fed on bamboo leaves, which grow high enough above the ground, instead of grass. The ponies are very fond of the leaves, which the natives tell me are especially good for all chest affections in horses, "good for the wind," etc. In Europe, cattle feeding on rich, long pasture are said to be more subject to the disease than those feeding on short grass, biting it off close to the ground.

34. *Dry Grass.*—Mr. Daly lost two valuable racing Waler ponies at Silchar in 1877, which were taken great care of, and fed on dried doob that had been stacked for them like hay. This is worth knowing, for the Government of India last year sanctioned an

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experiment to be made at Barrackpore (the worst station for Anthrax in Bengal), by giving hay-doob to the horses of half a battery, and fresh doob to the other half, to see whether those having the hay-doob would be less subject to the disease than the others, as some thought they would be; but during the time the experiment was carried on, the disease did not appear at the station.

35. *Jheel Grass or "Wild Rice."*—Before quitting the subject of grass, I may be permitted to state that the horses of the Bengal Cavalry have been wonderfully free from Anthrax at Barrackpore during the past three years, where there have been several serious outbreaks among the horses of the Royal Artillery, the latter having better stable flooring, and better sanitary arrangements generally, with very good-looking doob-grass, while the Bengal Calvary had "jheel grass," a kind of wild rice growing in deep marshy ponds, which has to be fetched in a boat, and cut just above water; it was always given wet; the horses are very fond of it, and keep good condition. I cannot account for the Bengal Cavalry horses being so much more exempt from the disease, unless it be the difference of grass, but I offer this as a conjecture only.

36. *The Season.*—I have already remarked that the disease never appears in Cachar except in the dry season (*vide* par. 27), and it is more common in the latter half of that season—from 15th January to 15th April; the disease disappears from the district every year at the commencement of the rainy season, whether that be early or late, no matter how common or widely distributed it was before. It has also been much more common in the Brahmaputra Valley each year during the dry season, though cases have occurred there occasionally during the rains. Col. Johnston states that the disease appears in the Manipur Valley at all seasons of the year (*vide* par. 1, B), but he does not say whether it is more common at one season than another. It is necessary to consider this question of season a little before we proceed to that of the drinking water.

37. Paragraph 11 of this letter shows how the valleys of Cachar, south of the Barak, are left at the commencement of the dry season, after the subsidence of the annual inundations, covered

with a fresh deposit of slimy alluvium upon the vegetation of the previous year, which must proceed to decomposition. But the first period of the dry season, when the moisture and the other emanations are being evaporated like feverish perspirations from the fens, is not the period for Anthrax; that is the time when intermittent fever is common there, and still more on the tablelands north of the Barak at the foot of the high mountains. After the land is well cracked and dried, when the large rivers are very low, the Barak having gone down about thirty feet, many of its tributaries dried, doob-grass growing on the dry beds of swamps, other swamps shrunk into small ponds of green jelly, the tanks used by natives for drinking water and for bathing are even too filthy for the requirements of ceremonial religion, many of the wells are dry, and the little water which remains in others is often dangerously impure. People do not complain now of intermittent fevers, but of bowel complaints, and this is the worst season for Anthrax among the horses every year. The "winter" of 1878-9, when Anthrax was epizootic in Cachar and the Brahmaputra Valley, was uncommonly hot and dry.

38. *Conditions favouring the Development of the Bacillus.*—Prolonged heat and dryness, with exposure to the sun, are known to favour the development of the common and apparently harmless Bacilli in stagnant water and organic infusions, such as we commonly find in Cachar and the Brahmaputra Valley. Such are the conditions also found most favourable in laboratories for the artificial cultivation of the virulent Bacillus of Anthrax.

39. If we admit that the Bacillus of Anthrax and the common Bacillus are developed by nature side by side in the same damp soil or stagnant water, the mystery of the disease is solved for all practical purposes, provided the Bacillus is the real cause of the disease.

40. *How the Bacilli are propagated.*—If the Bacillus of Anthrax is naturally developed in stagnant water under favourable conditions, it may be conveyed to animals by the air as well as by drinking water; so that the fact of animals drinking pure water becoming subject to the disease is no proof that the cause did not originally develop in water.

A. It is admitted by all that the spores of the common Bacillus are carried about in the air, like those of the Bacteria of putrefaction, sown broadcast everywhere, ready for development wherever they find favourable conditions. They may be found in scrapings from the gums and the necks of the teeth of most people, and their very universality is the chief reason why some eminent investigators continue to disbelieve that the Bacillus found in Anthrax blood is the cause and not the product of the disease; they think it is only the common Bacillus which has acquired virus by its development in diseased blood, which virus, when thus once acquired, adheres to it through all its future generations, though it may be modified, as before stated in par. 27. This is not the place to enter deeply into that controversy which is still proceeding among those who make those low organisms a special study; but I wish to show that, whether the Bacillus of Anthrax and the common Bacillus are specifically the same or not, there is no cause for doubting that the spores of the one are conveyed about and sown broadcast by the same atmospheric and other agencies as are the spores of the other; and if we can understand how the spores of the common Bacillus are propagated, we can also understand how the spores of the Bacillus of Anthrax are propagated, and with them the virus causing the disease.

B. In the laboratory we find that the fluids which are most favourable for the natural development of the common harmless Bacillus are also the most favourable for the artificial cultivation of the virulent Bacillus of Anthrax, by transplanting it from the diseased blood into those organic solutions. What is thus done in the laboratory is carried on naturally outside, not only by atmospheric agencies, but by the animals which feed upon the carcasses. Jackals, vultures, crows, flies, etc., convey the blood swarming with the virulent Bacilli from the carcasses to the water which they drink, and if that water is stagnant, under favourable conditions those poisonous fungi will multiply in it to an incalculable extent, and it becomes a centre for the spread of infection, exactly like the impregnated fluid of the laboratory.

C. The spores of the Bacillus may rise from the scum of the wate· with the invisible steam that always evaporates from water

exposed to the sun, as well as in the denser fog which is so common in swampy districts.

D. When the stagnant pond in which these organisms are developed becomes shallow by evaporation, after long exposure to the sun, they flourish more in it. When the water has all been evaporated the spores remain on the surface of the dry mud; and when that is pulverized and raised as dust by the wind they are scattered about; most of them perish by natural agencies, but a few find congenial soil and circumstances elsewhere sooner or later and propagate anew. When doob-grass grows on the dry bed of such a pond or swamp, and its creeping stems or roots are dug up for horses to eat, what remain of the low organisms which flourished in the water are also taken with the soil adhering to the roots.

41. I beg leave to remind you here of what I have already stated in paragraph 9, that in Europe the disease is reported to have disappeared from swampy districts entirely after they have been drained, though it was very common previously; and in Cachar the disease always disappears with the annual advent of the heavy rains which flush the land and inundate the valleys; the stagnant ponds and the beds of the dried ones are thoroughly washed out, and all embraced in one common flood of fresh water. The wells are also filled with water freshly filtered through the sandy beds.

42. *The Drinking Water.*—As might be supposed from the geological report of Mr. Blandford, quoted in paragraph 9, the water in the wells sunk in the low clay land of Cachar is not good; the water at the close of the dry season will not keep many days without tasting offensively, though it may appear clear and taste well at first. But it is better than the water from the tanks; and when the dry season advances, the natives reserve it for themselves when they can get it, and give the worst water to the ponies. The river Barak is filthy when it becomes low in the dry season. But there is always good water in some of the wells sunk deep in the sandy upland tea gardens, and I found ponies drinking from them got the disease like those which drank bad water, though I am of opinion not nearly in so large a proportion. It was not possible to obtain exact statistics to show this. Some tea-planters told me that they had often thought their ponies were more

subject to get the disease after a long journey from home, and they attributed that to the probability of the syces having given them stagnant water on the road. But that does not account for those cases, not very uncommon, where four or five ponies stood in the same good stable, having good grass and good water, and the majority of them get the disease the same day and die in a few hours. It is more probable that there are swarms of infectious spores carried about in the air, and when a stable full of ponies stands in the path of the poisonous currents several of them are destroyed together.

43. The evidence at Gauhati is very strong in favour of the theory which attributes the disease to drinking stagnant water from tanks and swampy ponds. I was informed by Captain Willans, R.E., Mr. Bell and Mr. Aitken, tea planters, and others of the oldest European residents, that during the epizootic years 1878-9 and '80, no horse got the disease in stables where it was more convenient for the syces to water the horses at the river than at the tank; but in every stable where it was more convenient for the syces to water from the tanks than to take them to the river, there the disease appeared, and the mortality was very great. I visited every compound in the station with a map, on which was marked where horses of Europeans died, to verify this statement. I have already drawn attention (*vide* paragraph 19) to the remarkable fact that out of the five stables occupied on the river side, the disease appeared in only one of them, and that one the most elevated in the station, on a non-alluvial clay, raised up by projecting granite. There four horses died of Anthrax. The explanation offered is this, that it was more convenient for the syces to water them at the filthy tank opposite the Dāk bungalow than to take them to the river, or to bring river water for them because of the steepness of the rock at that place. There are no wells at Gauhati, and the tanks are all exceedingly foul at the close of every dry season; they were unusually so in the prolonged dry season of 1878-9, the epizootic year.

44. I was informed by Captain Willans, R.E., that when the disease appeared among the Tonga ponies at Nongpoh, he suspected the cause to be the stagnant water of the tank which they always drank, and he ordered the Baboo in charge not to allow any

of the ponies again to be watered there, but at a good flowing spring in the side of the hill not far off, the water from which was conveyed to the roadside by a bamboo pipe. Several of the ponies which were sent there afterwards, to replace those which had died, got the disease and died too, though Captain Willans firmly believed they got no water except from the pure spring. When I went there I found the ponies drinking the foulest water in the neighbourhood ; the Baboo pretended to know nothing whatever about the existence of the good spring, until I told him I had Captain Willans' authority for it. Then, after much prevarication, he excused himself by saying that the syces complained to him of the distance to the place where the good spring water falls on the roadside from the bamboo pipe, and begged him to let the ponies have the water nearest to the stable, and he allowed them because he thought it was of no consequence, for the Khansamah at the Dāk bungalow got water for Europeans to drink from the tank I complained of! The distance to the pure spring water from the Tonga stable, which is close to the Dāk bungalow, is only a few hundred yards on level road. It is therefore probable that Captain Willans placed too much faith in the Baboo, when he thought his orders were obeyed last year. At the stage named Burny, between Nongpoh and Gauhati, I found the Tonga ponies watered from a swamp close to the stable, though there is a very broad river flowing by within a hundred yards, and the excuse given to me for not going there for water was the distance! I am certain that is not in accordance with Captain Willans' orders.

45. *Anthrax is not known in Sylhet.*—No report upon Anthrax in Assam would be complete without something more than a passing notice of the district of Sylhet, where the disease is not known to have appeared yet, though it adjoins Cachar, and all the conditions which are supposed to favour and cause the disease in other parts of Assam and Bengal are found abundantly in Sylhet. It seems to me that we are not warranted in fixing upon any particular conditions as causes of the disease elsewhere, if we find them as much at Sylhet, unless we can also explain why they do not cause the disease there as well.

46. *The Sanitary Condition of Sylhet.*—The physical aspect of

Sylhet district is thus described in "Hunter's Statistical Account of Assam":—"Sylhet consists of the lower valley of the Barak or Surma river, an alluvial plain of about seventy miles wide, bounded north and south by high mountains, opening west towards the delta of Lower Bengal, and adjoining Cachar on the east The greater part of the district is a uniform level, only broken by clusters of sandy hillocks, called *tilas*, and intersected by a large number of rivers, watercourses, and drainage channels. During the rainy season, from about June to October, the torrents that pour down in cataracts from the hills, together with the heavy local rainfall, convert the entire surface into a boundless sea of waters, amid which raised village sites appear as islands, and the only means of communication is by boat. The rural post requires to be carried by boat for five or six months in every year. The banks of the rivers, as is the case in all alluvial tracts, are raised by annual flood deposit to a higher level than that of the surrounding country. The low strip behind the banks is every year subject to a protracted flood, and is usually covered merely by reeds and grass. Another portion is only liable to slight or occasional inundation, and here the villages are built on the higher spots, while the rest, which is very fertile, is under continuous rice cultivation. The village sites and all the higher lands are embowered in groves of bamboos, palms, and other trees. In the neighbourhood of Sylhet town, the *tilas*, or sandy hillocks above referred to, rise to a height of from twenty to eighty feet. For the most part they are overgrown with grass jungle, but some of them have recently been cleared for the cultivation of tea. The town of Sylhet is only fifty-five feet above sea level, and large portions of the district are considerably lower. The soil is for the most part a blue clay, which becomes black on the borders of the swamps or *haors*, as they are called locally." . . . .

"The chief epidemic disease of Sylhet is malarious Fever. It does not seem that any great change has recently been made in the sanitary condition of the district by the clearing of forests or the draining of swamps. Dysentery and Diarrhœa are prevalent, as also are many cutaneous disorders. Cholera and Small-pox not unfrequently appear in an epidemic form.

"Water for domestic purposes is obtained from rivers and tanks. There are few wells in the district. In the town of Sylhet the natives prefer the river water, and all who live near the river bank universally use it. Although it is polluted by dead bodies, burning ghats, and filth of all description, the tanks are in an even worse condition, and on the whole the preference shown for the river water is not irrational." (Stabled ponies are taken to the nearest place for water, without regard for quality, whether it be tank, river, or well.—G. E.) "With a few exceptions, the tanks are miserable puddles, most of which dry up in the hot season. The large tanks are defiled by bathing, and by the practice of washing clothes in them, cleaning cooking vessels, etc. They are never cleaned out, and as the ground slopes towards them this affords a ready means for all the filth in the neighbourhood to be washed in during the rains. They are, moreover, closely surrounded or overhung by clumps of bamboos and various kinds of trees, and the dead leaves fall into the water, filling it by their decomposition with organic matter."

47. Short doob-grass growing on the riverside, like that supposed to cause the disease sometimes on the south side of the Barak in Cachar, is occasionally used for feeding ponies in Sylhet also. But, as a rule, almost without exception in the town of Sylhet, a long doob-grass is sold in the bazaars, obtained from the dry clay beds of swampy tracts, which during the rainy season are about twenty feet under water—too deep, I was told, for rice cultivation. I visited some of these prairies, and was much edified thereby. The water deposits a rich alluvium every year upon the growth of the previous season, which affords good nourishment for the next crop. When the land emerges at the subsidence of the deluge in the commencement of the dry season, it looks as if it had been soaked in slime; but in a marvellously short time the sun dries it, intermittent fevers being common during the process of evaporation, and in a few weeks the country for many miles in extent will be covered by a coat of green doob-grass, which throws out longer blades than I have seen elsewhere. When the blades are full grown, they become brown and wither, but young shoots grow among them; thus

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there is a succession of crops throughout the dry season, and the ground becomes covered by a dense tangled mass of matted grass, which in its turn becomes submerged during the next rainy season, and with the alluvium assists in the natural process of land making. So it has gone on from prehistoric times; the soil is therefore rich in decomposing organic matter, and owing to the large proportion of blue clay in the subsoil, it is very retentive. Extensive swamps remain in many places unevaporated throughout the dry season. Ponies out of condition or lame are often turned loose to pasture on these grass lands. Some are sent there from Cachar. I am told that they usually do well, though occasionally they suffer from dropsy and worms, probably from drinking the swampy water. They must often inhale the emanations from the ground, which are retained by the density of the grass, the growth of which is such as to prevent, to a great degree, free ventilation on the surface of the earth. The stems of the creeping grass are but lightly adherent to the ground by delicate roots, very different in this respect from the common short doob, and the grass-cutters pull and break them off in handfuls instead of cutting below the surface of the ground, as is common in other districts with the short doob. Therefore, the stems, as a rule, come loose from the earth readily by pulling, the upper layer of alluvium in which it grows being only slightly consolidated. Yet the roots are far from being clean, and I found lumps of mud adhering to them before the ponies in the stables of gentlemen at Sylhet town.

(*To be continued.*)

Editorial.

THE FUNCTIONS OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

It appears to be the fact, that ever since the incorporation of the veterinary profession by the institution of the Royal College of Veterinary Surgeons, every attempt made to improve the education or position of the veterinary surgeon has met with more or less opposition, which was always more or less successful. This opposition has generally been made by persons in the profession itself, and arose from motives of self-interest, jealousy, or other unworthy feeling; and this has, in reality, been the principal cause for the very unsatisfactory condition of affairs

with regard to veterinary medicine in the United Kingdom. For very many years, it may truly be said that the Royal College was a mere appendage to a teaching school, and as such, improvement was impossible. Not long ago it escaped from this ignoble thraldom, and then attempts were made in earnest to introduce reforms in the education and status of the practitioner. But, as stated, every advance has only been achieved after a struggle, and it would seem that this kind of warfare must continue until at least a new generation of members obtain power, or the present generation takes a stronger and *more* decided stand than it has hitherto ventured upon.

The form the opposition has lately assumed has been upon the question as to the legality or power pertaining to the Royal College, in its endeavour to improve veterinary medicine; and on this ground the obstruction has been consistent and persistent. Threats of legal proceedings, prognostications of secession, discord, and disunion, have had such a powerful effect on the Council, year after year, that little good has been effected by the only body that can confer benefit or promote advancement. One cannot peruse the reports of the Council meetings from one year to another, without coming to the conclusion that the obstruction has been due to a very small number indeed of individuals, whose personal or pecuniary interests were not in harmony with progressive improvement, and that the Council was too timid and irresolute to defy them, and act for the welfare of all.

Whatever may have been the position of the Royal College previously, the recent Act of Parliament has placed it upon a new and a wider basis—one on which it is absolutely independent of these obstructionists who were, and are now, no friends to veterinary science in these kingdoms; and it is absolutely necessary that this changed position and enlarged function of the Corporation should be fully recognised by those who are responsible for carrying out the objects of the Royal College.

The Royal College of Veterinary Surgeons is constituted, by Act of Parliament, the body which is alone responsible to the public for the competency of those who are entitled to designate themselves members thereof; and this responsibility it must not, dare not, shirk. So long as it keeps on the path of improvement, and is determined that its licence to practise shall only be bestowed on those who are, by general education and professional training, fully competent to serve the public as qualified veterinary surgeons, it will have the countenance and support of Parliament and the confidence of the country—while its neglect to do so will not only endanger its own existence, but prove a source of inconvenience and loss, if not of peril, to the nation. Therefore it is that everything pertaining to the efficiency and proficiency of the aspirant to the Royal College diploma—whether it be in the way of general or professional education—comes within the purview and control of the Royal College, and it cannot neglect this without neglecting its duty.

The next part of its function is the protection, and the promotion of the well-being, of its members; and this is in itself a new duty imposed upon it, both directly and indirectly, by the Act referred to. Hitherto its usefulness has been, by the obstructionists, limited to examining students

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for graduation, and this it has only been able to do in a very imperfect manner. Now, however, that the Royal College is in direct relations with the Government, and through it with the public, it can and must exercise the powers it possesses to protect and promote the interests of the profession to the fullest extent; so that, while acting as a guarantee to the public that those whom it licenses are in every way competent as professional men, it must insist that these shall be recognised and received as such, and be accorded the privileges to which those belonging to other professions can lay claim.

There may be those in the profession who are desirous that it should remain in the abject and almost helpless condition in which it has been kept for so many years; but we earnestly hope that the members of the Council will not be influenced by their threats or misleading statements. So long as the Royal College is determined to benefit the public by improving the efficiency of its graduates, it can safely and surely defy those who would paralyse its usefulness, or keep it as a mere machine to register the production of imperfectly educated practitioners.

INFECTIVE AND "CONTAGIUM" DISEASES AND PARASITES IN MAN AND IN ANIMALS.

THE Regius Professor of Medicine, Dr. Acland, lectured on this subject on Dec. 2nd, in the large lecture room of the Museum, Oxford. A numerous and distinguished audience assembled, including Sir G. K. Rickards, Dr. Liddell, Dr. Freeborn, Dr. Darbishire, Dr. Burdon Sanderson, F.R.S. (the recently appointed Professor of Physiology), Professor Bonamy Price, Professor Prestwich, Sir Wm. Herschel, Dr. Child, the Rev. W. B. Duggan, the Rev. J. Dodd, the Rev. J. S. Treacher, Mr. W. W. Fisher, Mr. A. Winkfield, Mr. J. O. Sankey, Mr. C. E. Thornhill, Sir Henry Dashwood, Mr. J. Richardson, etc.

The lecture was the first of two on the subject, this being a *general* statement, preliminary to a *special* discourse on the particular case of the liver parasite of sheep, by Mr. Thomas, M.A., of Balliol.

The REGIUS PROFESSOR commenced by observing that he had no doubt it was within the knowledge of several who were present that the great surgeon, Sir Benjamin Brodie, sent a message to him from his deathbed, requesting him from time to time to deliver in Oxford such lectures as might seem useful to the growing popular opinion, on sanitary or medical matters; and it would also be within their knowledge that, acting on that request, lectures had been given there to large audiences, on subjects bearing upon the public health, in rural and in urban populations, and on institutions for the care of the sick, and many other kindred questions. He could not introduce the matter upon which he was about to speak more graphically, than by saying that he had received communications stating that the notice respecting that lecture was faulty in every particular, for that parasites could have nothing to do with contagion; that "infective" was a word that ought to have been "infectious;" and the expression "contagium diseases," if not actually bad language, was, at all events, quite improper. He hoped presently to give by a single illustration a clear reply to this mistaken criticism. There was a definition of contagion by one of the most philosophic of our scientific men, viz., Mr. Simon, which was this:—"Contagion is a term applied to the property and process by which in certain sorts of diseases the affected body, or part, causes

a disease like its own to arise in other bodies or in other parts. The Latin word 'contagium' is conveniently used to denote in each such case the specific material shown or presumed, in which this infective power ultimately resides. It might be, and in a certain sense was generally, a parasite; it was probably always a living organism." He explained this by exhibiting a remarkable parasite from New Zealand—the *Sphoria Robertsii*. It was a fungus several inches in length, whose spores when established in the body of a particular caterpillar, in process of time entirely occupied and supplanted all its texture, and so brought the caterpillar to a slow but certain end. That one illustration showed graphically enough in what way a parasite might set on foot an infective process, by which the unfortunate victim of its energies might be destroyed. It was an infective process set on foot by the material contagium of a parasite, peculiar to this caterpillar. This cleared the way to the whole question before them. It might seem somewhat remarkable, that whereas the question of the nature of epidemic diseases had occupied the attention of mankind for 2,000 years, that the ideas concerning the nature of them were of the vaguest possible kind, and in many instances entirely inaccurate. That might be illustrated by saying that though Hippocrates was certainly one of the most acute observers in respect of the maladies which afflicted mankind, wrote fully on the subject of those diseases which seemed to pass like a wave over masses of the people, he did not seem to be aware, nor did it ever apparently occur to him, that any depended upon contagion. This contagion had been, however, in recent times, in various ways entrapped, exhibited, and experimented upon, so that through the labours of several persons, every one, almost, still living, many of the phenomena and facts concerning the nature of this infective power were as clear as any object could be exhibited to them on the largest scale. But how difficult had been the inquiry, how remarkable had been the process of obtaining this knowledge, was one of the points which he would now show them. One person was present there to whom a large part of the knowledge which they possessed on that subject was due. It was shown, in a great measure in this country, that contagion, as it was called, that was, this infective quality, was a "particulate" substance, that was, a substance that might be caught and measured. If this particulate substance were removed from the infected atmosphere, then it was proved that, in many instances, the power of infection or contagion was also entirely removed—in other words, that the poison of most diseases was no longer mysterious, but tangible and visible. In some diseases this was not so. The poison of Scarlet Fever was not yet certainly known. He had concluded that the best way to illustrate this difficult question would be by describing one disease not occurring so much in themselves, as in various genera and species of the brute creation. There was a disease designated Anthrax, which might be translated as severe boil or malignant pustule. That, however, imperfectly gave them an idea of what the nature of the disease was. On a map of the world, the chief centres of the disease in Siberia, Russia, India, Japan, Germany, Finland, France, Spain, Africa, North America, Brazil, Paraguay, and Chili, were pointed out, as it affected all domesticated animals, oxen and sheep, dogs and cats, guinea-pigs, mice, poultry, and game, and in the East dromedaries, elephants, and goats; reference being made to the laborious works of Mr. Fleming in this part of the subject. It was a disease which, when once acquired, by contact with other animals or other causes, might carry off the victim in periods varying from a few days down to a few minutes. They would, therefore, observe this one factor, which he was anxious should be clearly understood—they might have a condition which would more rapidly or more slowly affect creatures of every kind, in every part of the world, with practically nearly the same result in all, viz., death. He would

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not harass them with painful details, proper only for medical men and pathologists, concerning the various modes by which the cessation of life was produced: but he would rather proceed to show what were the circumstances which set up the disease. He would endeavour to trace a portion of the life-history, as it was called, of the organism by which it was so caused. There was discovered, not many years ago, in the different textures of animals dying of this infection a small structure, which he would presently show to them, now accepted as belonging to the vegetable world, although for many reasons positive distinctions as to the nature of the lower kind of living beings were to be taken with considerable reserve. These minute vegetable organisms were called Bacteria, and in this case Bacillus Anthracis. These Bacilli, when found in the textures of animals that died of the disease, consisted mainly of slender rods. These rods grew to a certain length—in an example he had about 1-3,000th of an inch in length, and 1-25,000 in diameter. They were then seen to have a tendency to divide, and in dividing to separate the matter contained within the envelope which constituted the filaments, and in the division were observed to carry off with it a portion of the within-contained living protoplasm. These filaments, as they grew, became entangled or twisted into a beautiful rope. (These points were all explained on diagrams drawn by Mr. Drummond, the Radcliffe artist.) All these structures, through the kindness of friends, Professor Lister, Professor Burdon-Sanderson, Dr. Sharkey, and his son, Mr. Theodore Acland, he would be able to show them presently under the high powers of the microscope. It might be asked how it came about that the spores which were now known to be the way in which the disease was communicated, were so universally communicable in every part of the world? They were cast off from the bodies of the unfortunate possessors of them; they might be buried with them; and brought again to the surface by worms, in the opinion of M. Pasteur, though this fact had lately been questioned. They dried up, they floated away in the air, and although he did not say that these particular germs had been caught in the air, or could be so exhibited to them, yet it could be shown that multitudes of spores of various kinds of Bacteria might be and are so caught. (This part of the subject was illustrated by an apparatus at work, arranged by Mr. W. W. Fisher, showing how the air in the theatre might be entrapped, examined, and Bacteria and other substances found in it subjected to the highest powers of the microscope.) The lecturer proceeded to deal with the very difficult question of how it had been that M. Pasteur, whose name they all knew, made the discovery which had created a great sensation throughout the practical as well as the scientific world, that by a certain cultivation, as it was called, of these Bacilli in nitrogenous solutions, or broths, he succeeded in depriving them of the virulent principle by which the disease was communicated. First of all, he should say that M. Pasteur, many years ago, made experiments upon the fermentation of beer, and he found, what was indeed well known, that fermentation of beer depended upon the growth and chemical changes produced by the small "Yeast plant," the *Torula cerevisiæ*. He found by carefully observing its life-history that he was able to make certain deductions as to the reasons and nature of the chemical changes made in the alcoholic or acetous fermentations. At a previous period he had been engaged in studying the diseases of the silkworm, and in doing so he had observed many of the changes of which a parallel might be found in the disease of which he (Dr. Acland) was then speaking. M. Pasteur then studied the so-called cholera of fowls, and he found by a series of experiments that he could, through continued "cultivations," extending to a hundred or more generations, produce modified or "attenuated" virus of almost any strength; the vitality of the plant was, in fact, diminished by exposure to oxygen. He (Dr. Acland) would on this occasion pass over

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the full history of the nature of the discovery; and summed up by saying that M. Pasteur, by a succession of splendidly-conceived experiments—wonderful partly from the scientific accuracy with which they were conducted; partly by the ingenuity with which they were contrived; partly by the patience which he for many years bestowed upon them—came to the conclusion that he could so cultivate the microbes of the Splenic Fever in sheep, that he could gradually deprive them of their virulence; and in the end, as had been established by Jenner in the case of vaccination, he could so inoculate the animals which were amenable to the disease, so as to make them absolutely refractory against the disease in future. But now, he (the lecturer) was sorry that he was bou nd to say that some doubt had been thrown, within the last few weeks, upon the certainty and safety of this process as regards all varieties of sheep. He had applied to M. Pasteur's agent for some of the vaccine matter which he supplied for the inoculation of sheep against this disease, and of which great quantities are now prepared in M. Pasteur's laboratory. There were two lymphs to be applied by a first and a second inoculation. The first produced modifying effects, and then the second afterwards was believed to bestow entire immunity from the disease. The precise mode or preparation of these substances was not at present fully known. At the same time he (Dr. Acland) received a portion also of the virulent virus which was exhibited. Now, he was sorry to say that Dr. Klein, a most skilful investigator in England, upon using this vaccine, instead of producing the effect of immunity from the disease, had communicated it and had caused the death of sheep by the very matter which was supposed to give them security against Anthrax. All that could be said under these circumstances was, that the particular vaccine matter thus sold in France could not be considered to be of such a nature as to justify its application or trial by persons who were not scientifically educated for the purpose, for there were many niceties to be observed in several respects, into which he would not now enter. Upon receiving this information as to the doubt which was thrown upon the value of M. Pasteur's discovery—a doubt which Dr. Klein had communicated very properly to the Local Government Board—he felt it to be his duty to write to M. Pasteur; and his answer on the subject was most interesting. It showed partly his confidence in the certainty of his own investigations; partly the exceeding difficulty of the problem of procuring immunity in various races of animals (for the poison acts differently on different animals and different breeds), and partly it showed the entire candour and goodness of the man. He was anxious to obtain all the information that he could in England on the subject, and he sent to him some papers including one which he had read at Geneva, in which he had met many of the difficulties which had been pointed out to him, as to the perfection of this process. He said that there were now in France 400,000 animals which had been vaccinated against this disease, 350,000 being sheep, and 50,000 oxen or cows. The result of all these vaccinations had been, that there had not been above one sheep in 300 that had suffered in any way from it; and as regarded cattle, there had not been above one in 2,000 that had been ill, in any sense, after the operation. Therefore, he himself felt quite sure that the results were entirely satisfactory, and he was quite confident in the full and ultimate success of the procedure. The loss to France alone has been by hundreds of thousands annually. The question was asked, "What is the nature and character and reason of these epidemic diseases, which go like a great wave over the world, from time to time?" In a work by Mr. Fleming, Veterinary Surgeon of the Horse Guards, they had a record of the chief epizoötics in all periods of the world's history. They observed that certain diseases were very rife at certain periods, and that then they passed away. In this country Ague was one of these; Leprosy was another. It was a very rare thing that they saw a case of Leprosy in

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England, although Mr. Sankey had informed him that there was in Oxford at that moment the case of a person who had acquired it in India. One asked upon that, was it so, that diseases might decimate not only themselves, but animals inferior to them, at one period of the world, and disappear at another, and return? Was it so, that they could hope to see them entirely driven out of nations, and out of animals, by this or that protophylactic measure, as in the case of vaccination, whether Jenner's or Pasteur's? Was it so, that carelessness or sentiment might revive these plagues; was it that the follies of uneducated and thoughtless people should make it even a question possible to be asked, as to whether the plague of Smallpox, by reducing the severity of the vaccination laws, was to again be made to rush once more over the population? Did it not seem to be true, from the investigation of Professor Sanderson and others, that they had a key to the way of stopping a great part of the several plagues which came from without upon them, which were introduced into the organism, and which could be handled, and checked, and stopped by the means of scientific investigations which had risen up within the last twenty years? And was it not in a place like that their bounden duty to foster all biological and pathological study, that could increase this kind of knowledge, and see in what way these enquiries for the positive good of mankind and the brute creation, which was placed in a certain sense under their care and attention, could be brought to greater perfection than they had already been? He confessed the subject was one which seemed to him as worthy as any other which could by any possibility be carried on in this place; and he hailed with the utmost satisfaction the circumstance that Dr. Burdon Sanderson should be settled amongst them, to encourage by the weight of his great reputation, and direct by his trained scientific skill, all physiological and pathological studies in their highest departments. (Applause.)

The lecturer concluded by alluding to the astonishing series of changes by which decay and life alternate in a vast and never-ceasing cycle, and by a touching reference to the abilities and personal character of the late Professor Rolleston, who had fostered in turn, by his almost superhuman activity, almost every method by which the happiness and well-being of mankind could be increased, and whose work was now being continued and extended by Dr. Burdon Sanderson and Professor Moseley. Dr. Acland then announced that Mr. Thomas would describe on Wednesday, in a special and detailed manner, one instance of that which he had endeavoured thus generally to sketch.

After the lecture numerous examples of the Bacillus Anthracis, the Bacillus of tubercle in every stage, and other kindred objects, including a beautiful Bacterium Lactis, lent by Professor Lister, were thrown under very high powers. Professor Burdon Sanderson displayed find photographs, by the oxy-hydrogen microscope, lent by Professor Clifton, of every stage of growth of the Bacillus Anthracis.

VETERINARY SANITARY SCIENCE IN INDIA.

AT very frequent intervals, communications reach us from India—chiefly, from members of the Army Veterinary Department there—strong and full of complaint as to the absence of any provision for checking the ravages of deadly contagious diseases, and the hard work and poor reward accorded to the veterinary officers. It is needless to say that the Department in India is in a condition of serious discontent, and that few veterinary officers will remain there a day longer than they are compelled to. What with the

miserly allowance of pay, the severe work in an unhealthy climate, and the absence of all recognition for services rendered, their position is indeed much worse than it would be at home. Such a state of affairs cannot be to the advantage of India; for if there is any department in that country that could more directly confer great benefits, it would be the institution of a well-organised body for dealing with contagious diseases of animals, and the improvement and proper management of all those domesticated creatures which go to form so large a portion of the wealth and working power in that country. The advantages of anything resembling in the slightest degree such an organisation India has never enjoyed, and until it is established the enormous losses sustained every year since the country came under the sway of the British Government, must continue undiminished, if they are not increased. Such neglect must tell seriously upon the financial and agricultural condition of India, and can have but one result.

As evidence of both grounds for complaint, we make the following extracts from two letters lately received; they are ordinary specimens of what are sent us from nearly every part of that immense country. It may be mentioned that the letters are from two of the most competent, zealous, devoted, and hard-working veterinary surgeons in the Department:—

"I feel more than guilty of remissness in not having contributed anything to your Journal for such a length of time; but, believe me, it is simply an impossibility. Mr. Meyrick will be able to tell you the amount of work which he had to do before leaving India, and when I say that it has daily increased, you will readily understand that I have my hands more than full. I can only say that I cannot go on long at this rate, for my health won't stand it. To give you some idea of the work, I have 201 horse and 146 donkey stallions. These are spread over twenty-three districts, which may be said to represent counties at home, and in these districts I have over ninety stands. These stands extend over a tract of country 500 miles from north to south, and more than that from east to west. None but selected mares are allowed the services of the horses, and it is my duty to inspect every one, and if suitable to brand them. Of these I have already 8,000 on the registers, and many more are waiting for me. Very strong representations have been made to the Government of India, showing the necessity for my having an assistant, but you can form no idea what we have to contend with. The reply was to the effect that they considered an intelligent native might do the work: or, in other words, a native with no veterinary knowledge was to go about the country inspecting mares, and deciding whether they possessed hereditary unsoundnesses. This intelligent native would also have to select stallions for the different classes of mares met with in this vast extent of country. These are the things which disgust us out here. Government has an idea that a man in India should be capable of filling any post, although he may have had no previous training. To give you an example; an officer who had been employed during his whole service in the stud department, was, on the abolition of the studs, sent to Calcutta as superintendent of clothing. But sufficient about this. I am sending you a Civil and Military Gazette, in which you will see an article on the cattle fairs in the Punjab, and below it I have added a paragraph from next day's issue, giving an account of an outbreak of Rinderpest in the Sialkote district; but it is not only in this district in which it exists; it is prevalent in three or four more. The importance to India of the suppression of these epizoötics is enormous. India being a purely agricultural country, should be protected more than many others; still the veterinary profession is in no way utilised. The Punjab Government is the only one that possesses a veterinary surgeon; but even there one man to superintend a tract of country the size of Germany, is lost. Mr. —— is doing his utmost, but unaided; and with no legislation

on the subject, his is very uphill work. Before he took up this appointment, I worked it for twenty months, and I can assure you it was heartrending to march through the country, and see the havoc caused by these diseases. I have frequently gone into a village in which 100 ploughs were at other times employed, and found that not a single head of cattle was left. To meet the requirements of this province alone, I have proposed to place a well-trained salutree in each lelisal or parish; the cost would not be much, and could easily be borne by the district funds. I have also drawn up a short Act, which would assist greatly; but with such an apathetic Government, I do not think there is a chance of its passing. The only way to get anything done is by agitating at home. If Mr. – — and I could only find time, we might compile most astonishing statements.

"You would scarcely believe the small amount of recognition we receive out here; in fact, I do believe they are fast relapsing into their old belief that they can do without us. Umballa, Mian Mir, and Rawul Pindee, all important stations—the latter garrison consisting of 1 battalion R.H.A., 1 battalion R.A., 1 European cavalry regiment, and 1 Native cavalry regiment, also a large transport and commissariat depot, are actually without a single veterinary surgeon; and in the face of this, Government is so weak as to believe they can do with twenty-three fewer men. Our men out here are nearly all sick, and it is not to be wondered at; for whilst combatant officers are snug in their bungalows at 8 a.m. in the hot weather, veterinary surgeons are out till 11 and 12, exposed to the intense heat. We want a very strong P.V.S. out here, but I suppose until something is decided about this Indian Department no one will be appointed.

"I have now been out nearly six years, and very often I seriously think of asking to be relieved, so as to go where we are valued. My only regret would be to leave my work, of which I am very fond; but even this, I fear, will not keep me out long."

A portion of the second letter is as follows:—

"I forward you a copy of a return showing the progress of cattle disease in the Sialkote District, which may perhaps be interesting to you. Please remember the numbers shown are only those reported by the native police constables, and probably represent about two-thirds of the actual number of deaths. Also consider that this is only one very small district of the Punjab, and you may form some notion of the enormous extent to which the disease prevails, and the return shows that about 1,200 cattle were attacked with Rinderpest, and of these more than half the number had perished.

"It is very extraordinary that at this time of day such a state of affairs should be allowed to exist; but so it is, and it is to be deeply deplored."

SWINE PLAGUE.

A LETTER was read at a recent meeting of the Académie des Sciences from M. Pasteur, giving an account of his progress in some researches in which he is at present engaged in the district of Vaucluse. He has gone there to investigate a disease of pigs, which, in one valley of the Rhone, has recently been fatal to 20,000. The disease is called "le rouge des porcs;" and M. Pasteur announces that he has discovered its cause to be a very minute organism, which in point of size resembles that of chicken cholera. It differs, however, in its physiological properties, since it has no action on fowls, but it is fatal to rabbits and pigs, especially to white pigs. M. Pasteur has convinced himself, by experiments, that one attack affords protection against another, and he has succeeded in inoculating pigs with organisms which have been weakened by culture, and in thus rendering these animals insusceptible.

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This disease is, we apprehend, the Swine Plague with which we are painfully familiar in this country. We look forward with much interest to the results of Pasteur's experiments, and especially those in the direction of protection from the disease, and will keep our readers informed as to their progress. It is rather astonishing that nothing in the way of experimental protection inoculation has been tried in this country.

FRAUDULENT WARRANTIES.

THERE have been great advances made in veterinary science during the last forty years, says the *County Gentleman*, and when one remembers the old-fashioned farrier riding about the country and London, having a bag on his horse containing the most formidable-looking instruments of torture ready for the docking of a horse's tail, for firing his legs, and for bleeding, and compares him with the well-dressed man of the present day in the brougham, we begin to wonder at the change. Are these gentlemen of the present age far above their predecessors in practical and scientific knowledge? We believe they are in both respects, and more humane in the treatment of both horse and beast. The great cause of this is not far to seek, as the early education of veterinary men is much better attended to now than formerly, and the benefits derived from their college studies make them more competent for the work in store for them. But the object of our writing is not to dilate upon the work of the college or the benefits conferred by it, but to call attention to the questionable practices on the part of those who are bringing a most honourable profession into disrepute. We allude to a class of men who are mixed up in horse-dealing transactions. In the old days, if a horse was purchased privately, whether of a dealer or private gentleman, a written warranty was generally offered and accepted; but the animal is now open to veterinary examination, and the consequence is that many dishonourable members of the profession lend themselves to a practice which is a disgrace to the members of the Royal College of Veterinary Surgeons. We have often brought under our notice the transactions of these men, who for a commission from the low dealer are ready to give a certificate of soundness, but generally write the words, "to the best of my belief," and in cases of very palpable unsoundness are careful to remark that there is a slight so-and-so, which "I do not think will interfere with his or her usefulness." Within a short time the so-and-so developes into a serious lameness, and then the certificate is often put down to ignorance on the part of the vet., with no intention to deceive. Veterinary surgeons of more determined opinions will say at once, "I have examined, etc., etc., and consider the animal to be perfectly sound." This unprincipled man cares nothing as to the result, knowing that if the purchaser be a fighting man the dealer will not go to law in the end, but take back the animal. But how many purchasers would say, "I would rather give him away than go to law about a horse"—many, for the reason that the trouble is too great, or that they do not like the idea of its being thought that they know nothing of a horse. So unprincipled vets. and low dealers get off, and are ready to victimise the next comer with whom they may chance to have transactions. The remedy is really in the hands of purchasers, who should never go to a low dealer or employ a vet. who has the slightest suspicion on his character. The means for remedying the nefarious transactions we allude to should be in the hands of the Council of the Veterinary College, who should have the power of striking off the roll men who have done things which are injurious to the character of the profession they have entered. We are quite sure we shall

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have the approval of all honourable members of the veterinary profession in making these remarks, and we would add that it would be much to the advantage of the profession if they would at once take steps to purge their body of a set of men, many of whom, under cover of being considered first-rate practitioners, are guilty of acts for which men in a lower position in the profession have been placed in the dock.

Reviews.

DE L'EXTERIEUR DU CHEVAL. Par MM. A. GOUBAUX et G. BARRIER, Premiere Partie. (Paris: Asselin et Cie. 1882.)

The French are generally considered by outside people, and especially by the sport-loving British, as a non-equestrian race; and yet no country has produced so many classical works on the anatomy and physiology of the horse, and on the just proportions which the different parts of its structure ought to bear to each other, in order that a given amount of speed, strength, or beauty should prevail. Since the days of Bourgelat and Lafosse, the number of treatises which have appeared on what is termed by our friends across the channel the "exterior of the horse," are very numerous; and nearly all of them, written by amateurs or veterinary surgeons, display an amount of enthusiasm for the subject which is rather remarkable, while all attempt to fix the theory of proportions on a truly scientific basis.

In England it may be asserted that nothing of the kind has been attempted, though we proclaim and pride ourselves upon being the most "horsey" people on the face of the globe. True, Professor St. Bel, when he introduced the teaching of veterinary medicine and surgery from France into this country ninety years ago, also tried to inculcate a taste for the cultivation of the study of external form, which had been so successfully taught him by the great master Bourgelat, and the fruits of which are still existing in the monograph he published on the proportions of the famous racehorse, Eclipse. But with the premature death of St. Bel—a serious calamity for veterinary medicine in England—this study came to an end, and it has never been resumed.

Of all the works on "Exterieur" which occupy our bookshelves—and we fancy the list is pretty complete, so far as France is concerned—there are none which can at all compare with this, the first part of which lies before us. As might have been anticipated from the scientific position of Professor Goubaux, the distinguished director of the Alfort Veterinary School, and the talented professor of Anatomy and Exterior at the same school—M. Barrier—the treatise they have so far produced is absolutely exhaustive on the subject, so far as our knowledge at present extends.

Written in a simple style, and apparently sufficiently elementary to be read with ease and abundant profit by the amateur or student, it is yet a work of the highest scientific value, inasmuch as ordinary observation is put to the severe test of measurement and experiment, and these again are made to furnish scientific deductions, many of which have all the charm of novelty and ingenuity, while they are formulated in clear and precise terms.

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This portion of the work is devoted to what are designated "Preliminary Notions," and to the study of the "regions of the body," and "proportions." These different sections are dealt with in a masterly manner, the basis on which they are treated being always that furnished by the teachings of anatomy, physiology, and animal mechanics. In the "study of the regions" we have been particularly struck with the novel and original views propounded, and especially in the subsections treating of the neck, croup, ribs, and chest.

The beauties, defects, blemishes, and vices of the horse are all dealt with in a clear and yet scientific manner, and numerous good illustrations are given to assist in making the meaning of the authors still clearer; while to illustrate the theory of proportions and the motor powers of typical horses, a table is given of racing performances, which is also valuable as a reference to those interested in turf exploits.

From this short notice it will be seen that the work is one of no ordinary character, and is worthy alike the high reputation of its authors and the long-established fame of the Alfort Veterinary School. All who have had to do with the production of the work are to be congratulated on their success thus far, and we confess to a feeling of impatient anxiety for the appearance of the second part, when we shall be able to give the entire book a more detailed notice.

THE HORSE IN MOTION, AS SHOWN BY INSTANTANEOUS PHOTOGRAPHY, WITH A STUDY ON ANIMAL MECHANICS. By J. D. B. STILLMAN, A.M., M.D., Executed and Published under the auspices of LELAND STANFORD. (London: Trubner and Co. 1882).

There could not be a better companion work to the "Exterieur du Cheval" than the handsome quarto volume, published by Trubner, of Ludgate Hill. In the Notes and News columns of this Journal not long ago, there appeared a notice of an interesting lecture given by Mr. Muybridge at the Royal Institution, on "Animals in Motion," in which the representations of movement were shown by photography. The work just issued is in reality the substance of the lecture *in extenso*, and a most interesting and important addition it is to such works as that of Goubaux and Barrier, as well as those on animal mechanics, animal painting, and animal locomotion. The book is a veritable monument of skill, patience, and ingenuity in the photographer's art, as it chiefly consists of a large series of photographs of the horse, taken while moving at different paces—from the walk to a sharp gallop, cantering and jumping. There are also photographs of other animals taken during progression, these, as well as those of the horse, being represented in every phase of one act of a certain movement. These representations are the production of instantaneous photography; twenty-four cameras having been employed, and placed in line at intervals of a foot from each other, and so cleverly managed that, no matter how rapid the pace, each was capable of producing a clear and exact photograph by exposure of the exceedingly sensitive plate for the one five-thousandth part of a second.

The result is rather startling and bewildering, as it pretty well upsets everything that has been taught and exhibited with regard to the way in

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which a horse moves its limbs during progression, and particularly as to the function of the fore and hind limbs. These undeniably correct pictures also prove that artists generally—in fact always—represent horses in utterly impossible attitudes. The manner in which certain movements are executed is made perfectly clear by these admirably arranged and printed pictures. The act of walking, for instance, about which the most diverse opinions have been entertained by horsemen and veterinary physiologists, is lucidly demonstrated in a manner which admits of no doubt.

In addition to the very extensive series of plates, there are many explanatory woodcuts, while Dr. Stillman gives an excellent description of the locomotory muscles, and valuable remarks on movement having reference to the discoveries developed by means of the camera.

This wonderful book—for it is full of wonders, so far as the revelations it contains are concerned—deserves a more extended notice than we can afford to give it; but we trust that veterinarians and horsemen, as well as artists and physiologists, will patronise it. It may be mentioned as an evidence of the labour its production necessitated, that it required an outlay of 50,000 dols. (£10,000), a sum which was generously contributed by Governor Stanford, who owns the Palo Alto Stud Farm, where Mr. Muybridge toiled so long and so successfully in experimenting and photographing.

THE QUARTERLY JOURNAL OF VETERINARY SCIENCE IN INDIA AND ARMY ANIMAL MANAGEMENT. (Bangalore: Stephenson and Co.).

It is a bold venture at any time or place to launch a new veterinary periodical in the English language, but perhaps the most courageous instance we are acquainted with is now before us. The editors of this "Quarterly" (C. Steel, F.R.C.V.S., Inspecting Veterinary Surgeon, Bombay Army; F. Smith, M.R.C.V.S., 12th Lancers; and J. H. Steel, M.R.C.V.S., Royal Artillery), are all stationed in India, and, as many of us know, are enthusiasts in their profession.

We can see no reason why, under their zealous and able direction, the journal should not prove a success. Though the number of veterinary surgeons in India is small, yet there are many officers of mounted corps in that country who take an interest in matters equine, and will become subscribers. Besides, such a publication appeals to the profession outside of India, for even in the first issue there is much matter of general interest which will be perused with pleasure and profit by those who care to know what is occurring beyond their own sphere of action. The number of articles contained in the table of contents is large, and all are good, though some of them are more instructive and valuable than others. The only requirement discernible is a little more attention to press-work; but this is more a matter for the reader or printer, perhaps, than the editors.

We wish the Quarterly Journal every success, and while we congratulate the editors on their first appearance, we trust they will not be dismayed or discouraged if their task does not meet with prompt reward all at once.

Proceedings of Veterinary Medical Societies, &c.

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

THE seventy-third quarterly meeting of this Association was held in the Medical Institute, Hope Street, on November 10th, 1882, the President William Leather, Esq.) in the chair.

There were present: Professors Williams and Hunter, Edinburgh; Messrs. Elam, Morgan, Reynolds, Bell, Moore, Kitchin, W. Wilsby, Donald, Morris, Hurndall, T. Leather, Butters, Brizell, Bain, Liverpool; Greaves, Faulkner, Hopkin, T. Taylor, W. A. Taylor, Locke, Ingham, M. J. Roberts, Manchester; Whittle, Worsley, Wilson, Nantwich; W. Woods, jun., Wigan; Lloyd, Denbeigh; and Stone, Little Hulton.

Dr. Rushton Parker, Professor of Physiology, School of Medicine, Liverpool, Messrs. Muirhead and Edwards, and several other gentlemen, whose names did not transpire, were present as visitors. Letters, regretting their inability to attend, were received from Professor Robertson, Messrs. Fleming, Lewis, Barnes, Storrar, Wolstenholme, and Barron. The minutes of the previous meeting were read and confirmed. The following gentlemen were elected officers of the society for the ensuing year, viz., Mr. R. S. Reynolds, President; Messrs. W. Leather, J. W. T. Moore, and E. Faulkner, Vice-Presidents; Mr. G. Morgan, Treasurer; and Mr. A. Bain, Secretary. On the motion of Mr. Whittle, a cordial vote of thanks was accorded to the retiring officers, to which the President briefly replied. Mr. ELAM proposed Mr. Wilson as a member of the Association; seconded by Mr. MORGAN, and carried. Mr. MORGAN proposed Mr. Welsby; seconded by Mr. BAIN, and carried.

Mr. MOORE nominated Messrs. J. Sutcliffe, Hurndall, Liverpool; Mr. FAULKNER nominated Mr. Brizell, Liverpool; and Mr. BAIN nominated Mr. Butters, Liverpool, and Mr. Lloyd, Denbeigh, as members of the Association.

Professor WILLIAMS, in the course of his lecture on "Louping-ill," remarked that it was denied that a mycelium could grow in the body; but he had proved, to his own satisfaction, that a mycelium could and did develop in the blood. In the disease known as "Louping-ill," or "Trembling," the animal has violent clonic spasms, and he had named it *Chorea Paralytica Ovis*. It prevailed particularly on the western slopes of Scotland. It was found in all altitudes, on all kinds of soil, and close to the sea-shore. The disease was to be found in animals on certain grasses of a certain age. Geological formation had nothing to do with it, provided we found certain other conditions. The disease is more fatal during cold easterly winds, more especially if associated with inclement weather; but the weather has certainly nothing to do with the causation of the disease. The disease occurs principally in the latter end of spring and early summer months. He had not seen the disease except where the tick was found. It was not common tick or "Red." It was found entirely embedded in the skin, so much so that it could not be removed unless by injuring or destroying it. It was a parasite that lived on the blood of its host. In the Isle of Skye there are two outbreaks of the disease, occurring in spring and autumn, and there are also two appearances of the tick, the disease appearing with it. Lambs that have not eaten grass take "Louping-ill," proving that the disease is not communicated by, or due to, grass. The tick conveys the organism into the sheep, may be, from the ground. The main symptoms are trembling, automatic movements, amaurosis, violent spasm, and, if frightened, the animal drops down utterly helpless, in many instances dying immediately. In some cases there is complete paralysis, in others paraphlegia, or hemi-

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phlegia. In all cases the appetite is good to the last. One noticeable symptom is distinct elevation of the nose.

Post-mortem.—The organs in some cases appear quite healthy, in others a gelatinous formation surrounds the spinal cord; it is non-vascular, of a very pale colour and jelly-like consistency. The organism has been found in the gelatinous formation, but not within the nervous matter. Patches of this gelatinous matter are to be found on various parts of the spinal cord, sometimes in lumbar region, and sometimes on medulla oblongata, etc., thus giving rise to the various forms of paralysis noticeable. Have never found anything inside or outside of the brain, but sometimes effusion takes place in the ventricles, due to the anæmic condition of the animal. In every case where the sheep were dying, the ticks were dying, and in every tick (whether on a diseased sheep or not) the same organism as in the sheep.

At the conclusion of the lecture, Professor Williams showed some beautiful microscopic specimens of the organism, and, taking advantage of the opportunity, showed specimens of *Bacillus anthracis*, and various other interesting specimens, being assisted by Professor Hunter, who manipulated the lime-light apparatus. During the time, many interesting questions were asked Professor Williams by the members, but as the lecture theatre was in darkness no notes were taken. A very hearty vote of thanks was accorded by acclamation to Professors Williams and Hunter, to which both gentlemen briefly replied.

The TREASURER proposed that the usual donation to the children's hospital, and the gratuity to the hall-keeper be given, which was seconded by Mr. WHITTLE, and carried.

The usual vote of thanks to the President brought one of the most interesting and instructive meetings of the Association to a close.

CENTRAL VETERINARY MEDICAL SOCIETY.

THE monthly meeting of this Society was held on the 7th December, 1882, at 10, Red Lion Square; Mr. J. Woodger, President, occupying the chair.

The other Fellows present were Messrs. T. Burrell, F. W. Wragg, C. Sheather, G. R. Dudgeon, J. Hall Brown, F. G. Samson, G. A. Banham, H. W. Caton, A. Broad, J. Rowe, G. Gray, J. Broad, Arthur Broad, T. Moore, W. Hunting, H. J. Hancock, and T. G. Chesterman.

Renal Calculus.

Mr. T. BURRELL exhibited a renal calculus, and said: Mr. President and Fellows,—This specimen, to which I have much pleasure in inviting your attention, was removed from an aged chestnut mare, that, to my certain knowledge, had been in almost constant work for about ten or twelve years without showing any symptoms of renal disease. She had, however, been subject to severe lameness, which I diagnosed as due to Rheumatic Arthritis; this was always relieved by a dose of purgative medicine and a day or two's rest. With the exception of these attacks, which occurred about every six months, the mare enjoyed good health. During the last two years the lameness increased, and latterly the animal, after lying down, could only rise with difficulty. I then advised that she should be destroyed, but at that time had not the remotest idea that any disease affected the kidney, neither had the attendant noticed anything abnormal either in the quantity or quality of the urine. This calculus, with the kidney containing it, was forwarded to me; a number of small cysts were situated on the surface of the latter, caused by obstruction of the uriniferous tubes; the calculus, as it lay in the pelvis of the organ, was coated with mucus. I have not noticed, in

any veterinary work with which I am acquainted, further allusion to this matter than the statement of the fact that calculi are sometimes found in the kidneys, no train of symptoms which would lead us to suspect their presence being described. I imagine that the formation of calculi is influenced in a great measure by the food which an animal takes; some descriptions of food, more especially roots, lead to the deposition of earthy phosphates. But the principal cause of these calculi is, I believe, that the horse is not allowed sufficient water; they are fed upon dry food, and kept at almost constant work, so that the skin acts very freely, with the consequence that sufficient fluid is not available to retain all the lime salts in solution. I think the practice (not perhaps so common now as formerly) of stinting horses in drink is most injudicious and reprehensible.

In the human subject calculi are often associated with the gouty diathesis; but this fact is not of great clinical importance to us, as uric acid is then the principal ingredient, not the carbonates, as is the case in our patient. Here, however, I think stimulating food is responsible for the tendency to calculus formation. In man the urine is slightly acid, and the formation of a cystic carbonate of lime calculus is accounted for by supposing that the urine retained in the bladder becomes decomposed, and earthy salts precipitated. In our patients the urine is almost always alkaline, as I can affirm from frequent examination; so that we have already present the condition which predisposes to the formation of carbonate of lime calculi. I am afraid that we dose our patients too freely with alkaline medicines; carbonate of ammonia, too, is very frequently given to horses in large doses, when the system is already loaded with urea; these substances being of very similar composition, I think the choice of drug is then anything but judicious.

I shall be pleased to hear expressions of your opinion concerning the connection between Rheumatism and calculus, and as to the manner in which these bodies may be formed. I am inclined to think that they are much more common in the horse than we imagine, but that they escape notice because, the ureter being so large, they pass readily downwards into the bladder. That they are thence ejected with the urine I believe to be no uncommon fact; I have known stones as large as horse-beans to be thus voided.

Mr. BROAD commented on the interesting nature of the specimen and description given, and instanced the cases of renal calculi quoted in Morton's work on the subject. The symptoms noticed were, occasional abdominal pain, tenderness on pressure over the loins, straddling gait, blood or mucus with the urine, and the negative evidence that no abnormality was found in the bladder or urethra.

Mr. WRAGG remarked that he had seen renal calculi much larger than the one before the meeting.

Mr. WOODGER regretted that he could not add much to the discussion from practical experience, as attention was so seldom called to these cases. He had found cystic calculus of rarer occurrence than formerly.

Tumour of Colon.

Mr. WRAGG showed a portion of colon from a horse which was taken to his infirmary on the 6th, and died the next morning, although it had been able to work till twelve o'clock on the night of the 5th; Peritonitis was diagnosed. About six gallons of serum were found in the abdomen, and there was much effusion beneath the peritoneum, especially around the kidneys.

The portion of intestine exhibited had a great amount of effusion under its peritoneal coat, and on the mucous surface was a soft, sarcomatous tumour,

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about three inches in diameter, which was the centre of an area of acute inflammation.

Several Fellows questioned Mr. Wragg upon points of the case, and referred to corresponding occurrences.

Concussion of the Brain.

Mr. HANCOCK laid before the Fellows a horse's brain with a small portion of bone attached to its base; in this situation was a large blood-clot, and much hyperæmia of the meningeal membranes; a very small fracture was found in close proximity to the pituitary fossa. The brain was taken from an aged chestnut mare. She had repeatedly suffered from Colic, and had an especially severe attack three weeks ago; she recovered, and continued well till Friday last, then, while being drenched for her usual complaint, she fell over backwards, striking her poll; on reaching home she was put in slings, and in about two hours violent excitement came on, followed by coma, the mare boring her head into the corner. She died at eight o'clock the next morning. Nothing abnormal was discoverable in the condition of the abdominal viscera. Mr. Hancock's surmise that cerebral disease existed before the injury gave rise to some discussion.

Mr. BANHAM urged that it was unprecedented for cerebral injury, or inflammation, to give rise to any symptoms simulating abdominal pain, coma or frenzy being the usual manifestations. He thought that if the mare suffered from brain affection, it was during the last attack, at which time a vessel might have given way.

Mr. WOODGER said it was evident that the immediate cause of death was hæmorrhagic effusion at the base of the brain, possibly caused while the mare was knocking herself about in pain. He referred to a similar case he had seen, in which the injury resulted from a blow on the frontal bone, given with an iron bar; the bone was fractured beneath the cerebrum, some of the vessels being ruptured; the clot found in this situation was very large.

Mr. HANCOCK wished to add that, although the symptoms of brain mischief were most marked during the second illness, he noticed that, after the first attack, to which allusion had then been made, the gait of the mare was very unsteady and staggering, also that when this attack came on she fell while at work. Although she walked home immediately after the severe fall she had on his premises, she never appeared to recover consciousness.

ALFRED BROAD, *Hon. Sec.*

YORKSHIRE VETERINARY MEDICAL SOCIETY.

A SPECIAL meeting was held at the Queen's Hotel, Leeds, on Wednesday, the 13th December, to consider if any, and what, action should be taken in order to reduce the large number of ineligible persons who are applying for registration as existing practitioners under the new Act. The President-elect, Mr. Joseph M. Axe, was unanimously elected to the chair, and there were also present:—Messrs. M. E. Naylor, J. W. Anderton, J. H. Ferguson, J. Tatam, B. Smith, F. Danby, J. Nettleton, Peter Walker, J. E. Scriven, G. Bowman, G. Whitehead, W. F. Greenhalgh, H. Cooper, H. Carter, G. Metcalfe, and the Secretary.

After considerable discussion, Mr. AXE proposed, and Mr. ANDERTON seconded, the resolution, "That in the opinion of this meeting all candidates for registration should produce their day-books and ledgers, in order to show that they have continuously practised veterinary medicine and surgery for five years," etc. Carried unanimously.

Mr. NETTLETON proposed, and Mr. WALKER seconded, "That all candi-

dates should have attained the age of twenty years, and have practised for five years subsequently." Carried unanimously.

The SECRETARY proposed, and Mr. NAYLOR seconded, "That it is the bounden duty of all members of the College to object to ineligible persons." Carried.

It was unanimously expressed that a great hardship had been inflicted upon the profession by allowing these persons to assume the title of veterinary surgeons.

WM. BROUGHTON, *Hon. Sec.*

THE NORTH OF IRELAND VETERINARY MEDICAL SOCIETY.

A MEETING of this Society was held on December 14th at the Thistle Hotel, Belfast. The President, Mr. Thomas H. Simcocks, M.R.C.V.S., Drogheda, occupied the chair. The other members present were Messrs. Chambers Belfast, and Doris, Cookstown (Vice-Presidents); Messrs. Dunlop and Giffin Belfast; Kernohan, Ballymena; James Dunlop, Downpatrick; Browne, Omagh; Sandford, Moneymore; Thompson, Lurgan; Murphy (visitor), Armagh; Creighton (visitor), Belfast; and the Secretary, Portrush.

Messrs. Stringer, Sherwood, and Finlay (students), and a few other gentlemen were also present as visitors.

Apologies for unavoidable non-attendance were received from Messrs. Simpson, Portal Inspector, Warrenpoint; Bradley, V.S., Newry; Mathews, Portal Inspector, Belfast; and T. Drummond, V.S., Dundalk.

The minutes of the last meeting were read and confirmed.

The SECRETARY then read a paper on "*Asthma, or Broken Wind*," which was well received and spiritedly commented upon by nearly all the members present.

ASTHMA OR BROKEN WIND.

The subject-matter of aforesaid paper may be summarised as follows:—In the definition of the disease, exception was taken to the theses of recent authorities, who state that inspiration is performed with ease, while the expiratory act has two apparent efforts. According to MM. Langeron and Laulanie, of the Toulouse Veterinary School, who experimented on normal and abnormal respiration by means of the pneumograph, the inspiratory act is difficult and interrupted, as well as the expiratory act. In studying the pathological development of the disease, we must consider what a prominent part is played by the free use of an artificially preserved diet such as hay, and the great tax a superabundance of this fodder is on the stomach, whereby the nervous energy of that organ becomes weakened; and that the derangement is subsequently transmitted to the bronchial tubes and air-cells by the fibres of the *par vagum*.

The primary effect of the irritation on the bronchi is to cause a diminution in their calibre, with subsequent paralysis and thinning of their walls, leading to rupture and emphysema. Broken Wind is altogether a disease of progressive development, and the morbid anatomy is modified by the stage at which the disease has arrived when we examine *post-mortem*.

Atonic Dyspepsia, being a usual concomitant, is produced by a withdrawal of some of the arterial blood-supply, which supply is partially diverted from the stomach to the lungs and muscular tissue when horses are called on to perform hard or fast work soon after repletion. The gastric secretion is vitiated in consequence, and the food often undergoes fermentation, and we have gases formed.

Hereditary taint is a predisposing cause, and gross feeding is sometimes an exciting cause, and sometimes an effect. The baneful effects of too much hay are strikingly apparent on horses in this country. Change of locality and change of air have a decided influence on asthmatic symptoms.

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In the treatment of Broken Wind a good and properly adjusted diet is absolutely necessary: a food composed of one part each of bruised beans and bran, and two parts of bruised oats, moistened with thinly boiled linseed, is a very nutritious and agreeable fodder.

Oleaginous substances, such as linseed mashes, and oil, and lime-water, are very useful. *Lichen Hibernicus*, or Carrageen Moss, could be advantageously substituted for linseed.

Of medicinal agents, the essayist found Belladonna the most reliable drug in this disease, also a combination of Arsenic and Nux vomica he found very beneficial. In the discussion which followed different opinions were very freely expressed.

Mr. JAMES DUNLOP approved of a special muzzle being applied, and of Arsenic and Nux vomica medicinally, but thought that Belladonna was contra-indicated.

Mr. GIFFIN believed that emphysema was present in all cases, as he never examined a horse's lungs, *post-mortem*, in which rupture of the air-cells was not clearly visible; he believed that emphysema was a cause, and not an effect of Broken Wind; he recommended the practice of watering horses before feeding them, and approved of Belladonna as a remedial agent; he did not agree with the idea of the disease being hereditary, but believed it was always caused by errors in feeding.

Mr. KERNOHAN thought we could have Asthma without emphysema, and referred to a case in which he saw the disease arising from an accident; although he had not tried Belladonna, he thought it would be useful; he found straw much better than hay in these cases, but why it was so—being equally bulky—he should like to know.

Mr. J. B. DUNLOP agreed generally with the essayist, and referred to the good derived from the discussion of such common subjects as the present; he believed that emphysema was present only in the advanced stages of the disease, which generally resulted from irritation of the bronchial tubes, such as we get in colds, etc. Indigestion, he considered, was an effect and not a cause; the wheezing noise heard on auscultation was due to mucus in the bronchial tubes; he did not approve of medicine in the treatment of the disease, but that most practitioners found sedatives either temporarily or permanently useful.

Mr. MURPHY said that the change in the asthmatic symptoms in different localities was produced by the different properties of the water; he found hard water very injurious in the disease, and that it should be softened by boiling. The horses should be bedded on sea-sand and sawdust; he believed that in 9-10th cases the disease was caused by derangement of the pneumogastric by improper feeding; he saw a horse badly broken-winded one morning and all right next day.

Mr. DORIS did not believe the disease was hereditary, and that it was not caused by bronchial irritation from colds, etc.

The PRESIDENT thought the difference in opinion arose from mistaking cause for effect and *vice versâ*, and that Broken Wind in nine cases out of ten was due to affections of the air-passages. He considered Broken Wind should be applied only to those cases in which we had rupture of the air-cells. In "setting" broken-winded horses, shot had a mechanical effect merely, which was due to its weight on the abdominal muscles.

The subject was so very freely discussed that two cases which were to have come on the *tapis* by the President were unavoidably postponed.

On the motion of the PRESIDENT, seconded by Mr. DUNLOP, a cordial vote of thanks was accorded the essayist.

Mr. GIFFIN then alluded in complimentary terms to the recent honour

conferred on the President by his being elected at the head of the poll to a seat on the Council of R.C.V.S.

The PRESIDENT suitably acknowledged the compliment, and explained several matters in connection with the "Veterinary Surgeons Act," particularly with regard to the registration of unqualified practitioners.

A Committee was then formed for the purpose of taking the matter into consideration, and for taking other necessary steps.

Messrs. Thompson, V.S., Lurgan, and Sandford, V.S., Moneymore, were proposed and seconded for membership, and will be elected at next meeting.

A cordial vote of thanks to the Chairman brought a very successful meeting to a close.

H. R. BRADSHAW, *Hon. Secretary.*

ROYAL (DICK) VETERINARY COLLEGE.

(*Continued from p.* 435, *vol.* xv.)

WHEN Professor Dick first began his class, veterinary medicine and surgery existed as an *art*, but it could hardly be said to have a place as a *science*. And so, doubtless, it was with the teaching. The prescribed period of study was hardly sufficient to teach what was to be done and how to do it. There was no time, while instructing students in the *art*, to teach them the equally important *science*, which explains the principles on which the *art* depends. We are told that Professor Dick's method of teaching was to begin with an outline of the anatomy of the different systems, and then to follow this up with an account of the diseases to which these systems were liable. In this he was for a number of years unassisted, but many of the lecturers in the medical and surgical schools of this city, with a generosity deserving of the highest praise, threw open their classes to veterinary students. Professor Dick was thereby enabled, even in the early days of the college, to turn out graduates of a much higher stamp than would otherwise have been possible. As time went on, and the number of students increased, Professor Dick acquired the assistance of other lecturers on veterinary subjects, and new branches of study were added from time to time; but instruction in more than the mere outlines of these was impossible.

In these times many excellent men were sent out from this school, but that was due to the genius of Professor Dick, and *in spite* of the system under which he was compelled to carry on his labours. No other veterinary teacher ever had the power of Professor Dick to inspire his pupils with enthusiasm for their profession. And it was this spirit, caught from their master, which afterwards brought so many of his disciples to the forefront.

It was only in 1876 that the prescribed period of study was extended to its present length. The curriculum now extends over three winter sessions of five months each, and two summer sessions of two months each. This was a great improvement, but the old difficulty was far from being removed, for along with the extension of time came new branches of study, rendering more than elementary instruction in many of them impossible. In this school courses of lectures, combined in nearly all cases with practical instruction, are given on no fewer than nine different branches of study. Each of these may be said to be indispensable, but the time is inadequate, and it is to be hoped that ere long it will be further extended.

The graduates of to-day have immeasurable advantages compared to those of twenty years ago. To take but one illustration. Twenty years ago the students received no *practical* instruction in the use of the microscope. Now they are taught practically not only how to apply the microscope in the

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examination of the normal tissues and organs of the body, but, in this school at least, they are taught how to examine for themselves those microscopic tissue changes in which we find the true explanation of most morbid processes.

The importance of this lies not so much in what is taught within the college walls as in the power that it will confer on graduates when they go out into the world to carry on investigations in a field in which the older graduates were powerless.

The present course of education is a great improvement on that of fifty years ago, but it still has its weak points. For these, however, an apology is hardly necessary, when the adverse influences are considered. It is obvious that to maintain a veterinary school, fully equipped with a well-paid staff of teachers, would be attended with no small expense. But the number of students necessary to meet the demand for practitioners at home, and in those of our Colonies that have not already veterinary colleges of their own, is comparatively limited; and, while fees are moderate, the sum derivable from this, the only source of income, must always be small. There is no encouragement to develop the teaching by adding new members to the staff, but rather the reverse; for such an addition can only be made by reducing the salaries of the existing teachers. It is this cause, more than any other, that has made our progress so slow. There is this to be said, however, that for whatever progress we have made, the credit is all our own, for no helping hand has been held out to us by Government.

Veterinary science has attained a more honourable position in most of the Continental States. In these, however, it has not been left to its own resources, but has been fostered by Government, and has had its education promoted by large grants of money. The intelligent liberality of these foreign States is in striking contrast to the short-sighted parsimony of our own Government. Thus France maintains, at an annual cost of several millions of francs, three fully-equipped veterinary schools. In the German Empire the annual grants for the same purpose amount to the large sum of £14,000. With a corresponding liberality, veterinary education receives State aid in Austria, Italy, Holland, and Belgium.* It is greatly to the national discredit that this country has persistently withheld support from a science which, unassisted, can make only slow progress, but which, if developed, would speedily confer the most astounding benefits on the community. The science is of the first importance to a country like ours, inasmuch as it is concerned in the conservation of the large amount of national wealth represented by our domestic animals. It is its province to diffuse among agriculturists a knowledge of those laws of health which should be observed in the management of their flocks and herds. For, just as in human medicine, so it is in our practice—the greatest achievements in future will probably be in the way of prevention and protection rather than of cure. Besides these, it is its more obvious duty to grapple directly with the many diseases to which our domestic animals are liable, to cure them where possible, or to inculcate the measures taught by experience to be the most serviceable and profitable for stamping out epidemics which, when unchecked, proved such an enormous source of dead loss to the nation.

All this is so obvious, that none will deny the important bearing of veterinary medicine on the national wealth. No less important, though perhaps less obvious, is its bearing on public health. It is a sad reflection that in this, and probably every other civilized country, there exists, at the bottom of the social scale, a considerable section of the population who, even when wages are highest and the necessaries of life cheapest, can barely provide

* It is the same in Norway, Sweden, Denmark, Spain, and Portugal.—Ed. V. J.

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themselves with that amount of animal food necessary to maintain the human frame in a state of health. These persons could not be said to be starving, in the ordinary acceptation of that word, but their systems are in a state rendering them an easy prey to disease that would not be fatal to individuals properly nourished. The number of our inhabitants who are in this state rises with every rise in the price of animal food, and everything that diminishes our food supply must in this way influence the death-rate. An outbreak of Cattle Plague would not produce in the public mind the same alarm as an outbreak of Small-pox, but it is unquestionable that the visitation of Rinderpest which we had in 1865-66 was the indirect cause of death to thousands of our population. But the well-being of our domestic animals has other and more obvious bearings on the health of mankind. We now know of not a few important diseases directly transmissible from the lower animals to man, and one need only mention the important subject of Parasitism to show how human and veterinary medicine are intertwined.

Indeed, our claims on State aid are unanswerable; but they were not recognised in the infancy of the science, when assistance was most needed; and there is no prospect that they will be recognised now.

An application was recently made for a Government grant to promote veterinary science, but it emanated from a quarter and in a manner that render its non-success a matter for slight regret. The application was made by the Council of the Royal College of Veterinary Surgeons. It is a corporate body, whose individual members are the qualified practitioners who hold its diploma. Its affairs are managed by a Council of thirty, elected by, and from among, its members. It was incorporated in the year 1844, and it is now the only degree-granting body in this country. It is, in short, the examining body, and that is its one important function. A deputation of its Council recently waited upon the Lord President of the Privy Council, and presented a memorial which was in several respects remarkable. It opened by referring, at considerable length, and in terms to which no exception can be taken, to the supreme importance of veterinary science to a nation like ours, and pointed out that, in contrast to other European States, our own had failed to recognise this, or, at least, had done nothing in a pecuniary sense to promote veterinary education in this country. And then there occurred the following paragraph: "The four veterinary schools in England and Scotland are, it may be said, private institutions, each belonging either to an individual, or being the property of subscribers who receive the value of their subscriptions in advice or medical treatment of their animals."

If this paragraph was introduced with any other intention than to discredit the schools, that intention is not apparent. But, moreover, the statement is grossly inaccurate. This institution is the property neither of an individual, nor of subscribers who receive the value of their subscription in advice or medical treatment of their animals, and those who made the statement were aware of this, or may be convicted of the alternative charge of inexcusable ignorance.

A little further on the memorial stated that "since its incorporation in 1844 the R.C.V.S. has provided the country with nearly 4,000 qualified practitioners."

If that statement is not inaccurate, it is at least, in the connection in which it stands, utterly misleading, and prefers a claim which is simply monstrous. What share had the R.C.V.S. in providing these 4,000 practitioners? Merely that of certifying, by means of its diploma, that these 4,000 practitioners, as turned out by the schools, had received an education that fitted them to practise. If the providing of these 4,000

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practitioners was a feat for which the nation owes a debt of gratitude, then only an infinitesimal portion of that debt is due to the R.C.V.S.

And last, and most remarkable, how did that enlightened body, which credits itself with having furnished the nation with its veterinary practitioners, and which charges itself with the exclusive duty of improving veterinary education, purpose to apply this Government grant? In erecting in London, at an estimated expense of £6,000 or £8,000, a building in which its Council of thirty members might be luxuriously accommodated on the four or five occasions on which they must meet in each year to transact its business!

I am very far from having any intention to discredit the influence of the R.C.V.S. within its own sphere. But its influence must always be secondary to that of the schools. Its sphere of action has been accurately enough defined in the charter of its corporation, and it will be best to confine its operations within that sphere. An important duty devolves on it in carrying out all that relates to the examining of students, and in fixing the minimum standard of qualification to be demanded of its graduates. It has to sift annually those students who, having completed the prescribed period of attendance at the schools, are desirous of being licensed to practise. In this way a grave responsibility rests on it, and it may be convicted, out of its own reports, of having failed to discharge this duty adequately. The annual report of its Council for the year 1880-81 says that "Serious complaint has been made, both within and without the profession, for a number of years as to the lack of knowledge of practical details on the part of some of the younger graduates."

Now, if this complaint is well founded, it reflects great discredit on the Examining Board of the R.C.V.S. It was a wise arrangement that took the power of granting degrees out of the hands of the institutions engaged in teaching. It is their duty to afford, to the utmost of their resources, an opportunity to students to acquire a thorough theoretical and practical knowledge of the duties of the profession. Even if this opportunity be afforded, there will always be a number of students who (some from inaptitude, but more from wilful neglect) will be comparatively ignorant at the end of their curriculum. But the Examining Boards exist for the express purpose of finding these men out, and if it be discovered that such men are let loose on the public, the logical conclusion is that the Examining Board is inefficient, and the sooner its reformation is set about by the R.C.V.S. the better. A logical conclusion, however, was not likely to occur to the Council of the R.C.V.S., which, by a majority of its members, decided to revert to the all-but-obsolete system of apprenticeship. A bye-law was therefore enacted ordaining, "That in and after the year 1884 no candidate for the diploma of membership of the R.C.V.S. shall be allowed to present himself for the final examination unless he shall have given sufficient proof that he has served a pupilage of at least one year with a duly-qualified practitioner, and that during that time he has conducted himself satisfactorily."

A minority of the Council protested that the charter of incorporation does not confer the power to enforce apprenticeship, and the highest legal authorities having subsequently expressed the same opinion, the bye-law had to be cancelled. But this apprenticeship is an object on which the Council has set its heart, and it is therefore preparing to move for a supplemental charter to give it the necessary power. To this application it will be the duty of the schools to offer their united and uncompromising opposition. In former times, a considerable number of young men desirous of entering the profession were induced to bind themselves as apprentices to veterinary practitioners, and this frequently for a period of two or three years, the practitioner at the same time exacting from them a fee which was often

enormous, considering that the advantages were rather on the side of the master than of the pupil. The latter had no basis of anatomy, physiology, or the other necessary branches on which to build a knowledge of the diseases that came under his notice, and such men were, on entering college, not one whit better, and often worse, than if they had never been apprenticed. As this fact became known, the custom of apprenticing pupils declined. At the present day it has all but disappeared, and with it has departed a considerable source of income to the practitioners who were party to it. It is dying from natural causes, and the supplemental charter is an attempt at its resuscitation. Although the system was never compulsory, there has been enough to test it, and I challenge its advocates to prove its advantages by an analysis of the prize lists, of the pass-lists, or of the relative success in practice of recent graduates.

By this same supplemental charter, an extension of power is sought in two other directions, in both of which it is desirable to confine the R.C.V.S. within its present limits. The Council is ambitious to have a hand in the management of the schools, a nd the supplemental charter is to give it the desired power. If there were any likelihood that this power would be granted those connected with the schools might well feel uneasy. At present the Council exercises an indirect influence on educational matters by its control and regulation of the examinations, and the way in which that influence is occasionally exercised makes one thankful that its powers in this direction are so limited. The Council elect the members of the Examining Board, and until lately it seemed to act on the correct principle that an examiner ought to have a thorough knowledge of his subject—in other words, that to examine on physiology required a physiologist, on chemistry a chemist, and so on. By the charter of incorporation, however, it is enacted that no one who is a teacher at one of the Veterinary Colleges can be an examiner, and therefore the examiners on such subjects as botany, chemistry, and physiology were chosen from the medical profession, and were almost always professors of the special subject on which they were appointed to examine. And this was an arrangement which inspired both students and teachers with complete confidence in the Examining Board—a confidence which has now been destroyed. Some enlightened members of the Council of the R.C.V.S. said that this was a stupid arrangement. They said, in effect, that it was a pity to see the examiners' fees going into the pockets of medical men, and that it was nonsense to maintain that no one should presume to examine on a subject unless he is able to teach it. These views commended themselves to the majority of the Council, which last week elected a new Board for Scotland, composed exclusively of veterinary surgeons. Upon that step comment would be superfluous. But along with this ought to be mentioned the other extension of power to be sought through the supplemental charter. At present examination fees amounting to £10 10s. are exacted from each student. That is the maximum sum allowed by the charter of incorporation. Power is now sought to exact a fee of thirty guineas—a sum which falls little short of the cost of his professional education.

These may be taken as examples of the manner in which the Council would treat matters of education; but it would be wrong to suggest that its members are actuated by any other motive than an honest desire to promote the best interests of the profession, though their conduct at times lends itself more readily to another construction.

The profession, it is admitted on all hands, is hardly what it ought to be, and the Council of the R.C.V.S. is, it must be confessed, thoroughly representative of the profession. From that fact we may draw the conclusion that its manner of looking at things will change as the profession advances, and in the meantime we may be thankful that its powers are so restricted.

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I fear that much of what I have said may seem to have only a remote interest to those whom I am supposed to be specially addressing. I should most certainly enlist your attention by professing to tell you how you may best obtain success in your examinations. But I would like you to have a higher incentive to study than the mere desire to obtain the legal qualification to practise, and you shall find it if you will believe that not only your success in that respect, but the amount of success obtainable in after life, is determined by your conduct during your studentship. If you are wasteful of your time and neglectful of your opportunities, you will make failure in your examinations almost certain ; and should you by a stroke of ill-merited good fortune obtain your diploma, your chances of being able to impose on a public that is every day becoming more discriminating will be small indeed. But if, on the other hand, you act up to a determination to pursue your studies with diligence, and to profit to the utmost of your power by the course of instruction which is here afforded, you will pass your examinations with credit to yourselves and your teachers ; you will have laid that foundation of knowledge that will render its further pursuit both easy and pleasureable, and you will have formed the habits that are most likely to lead you in after life to a position of professional eminence. Be diligent in your studies, and diligence will become an easy habit. Now is the time when the very acquirement of knowledge will develop your faculties, and make its further acquisition easy. Cultivate your talents, and knowledge will increase like money accumulating at compound interest.

You have elected to enter a profession in which, while there is not a little to discourage the beginner, there is more to incite him to effort. Some of the sciences have reached a stage where to those about to enter them it might seem that little remains to be discovered. In any case, that is likely only apparent ; but we, at any rate, are very far from having reached that point. To those who are ambitious to make a name for themselves in the field of original research, there is probably at the present time no profession which offers such allurements as our own.

Principal McCALL (Glasgow Veterinary College), in proposing a vote of thanks to Professor McFadyean, endorsed what the lecturer had said in regard to the treatment which the veterinary profession had experienced at the hands of the Royal College of Veterinary Surgeons. In regard to the new Examining Board, he was inclined to think such a step a great mistake. He was disposed to think that the number of veterinary surgeons able to examine in botany and chemistry, for instance, was not numerous, and he thought it was the feeling of the public that it was to their advantage to be associated with members of the medical profession who had done them a great deal of good. It was, he thought, a very ungrateful action on their part to refuse the services of medical gentlemen on the Examining Board.

Principal WALLEY, in proposing a vote of thanks to the Chairman, wished to state, as a member of the Royal College of Veterinary Surgeons, that while he gave his best thanks to the members of the medical profession for their past services to the veterinary profession, he at the same time thought that the old Scotch saying, that "every herring should hang by its own head," should be recognised by them.

ROYAL AGRICULTURAL SOCIETY.

AT the Council Meeting held on December 6th, 1882, Colonel Kingscote reported the recommendation of the Committee, that a grant of £250 be given for carrying on veterinary experiments during the ensuing year ; £50 out of this sum to be devoted to the continuation of experiments on Foot-and-mouth disease at the Royal Veterinary College. The Committee had received from

Dr. Roy a report on the series of experiments conducted by him at the Brown Institution on behalf of the Society, and they recommended that it be published in the *Journal*. The Committee had met seven times, and made seven reports, and they recommended that the following be the Committee for the ensuing year: General Viscount Bridport, Lord Moreton, Marquis of Stafford, Sir M. White Ridley, Sir J. Thorold, Mr. G. M. Allender, Mr. A. Ashworth, Professor Brown, Hon. W. Egerton, Mr. George Fleming, Mr. S. P. Foster, Mr. M. J. Harpley, Colonel Kingscote, Hon. C. T. Parker, Professor Robertson, Mr. G. H. Sanday, Dr. J. Burdon Sanderson, Professor Simonds, Mr. R. Stratton, Mr. W. H. Wakefield, and Mr. Jacob Wilson.

This report was adopted.

Obituary.

MR. E. A. EVANSON ASHE, M.R.C.V.S., died at his residence, Richmond Lodge, Blackrock, Cork, on December 8th, aged 56 years. He graduated in 1874; though at the time of his decease he had practised in Cork for thirty years, and gained a high reputation not only as a successful practitioner, but also as a horseman and patron of the turf. A local paper, in announcing the melancholy occurrence, remarks :—" Mr. Ashe was a man of renowned ability in his profession, and, like the late Mr. Robert Olden, V.S., obtained Professor Dick's medal for superior knowledge during his collegiate career. In his younger days he was passionately devoted to the pastimes of hunting and racing, and a pluckier or more finished horseman than he was it would be difficult to find. As an owner of good racehorses he was at one period notorious, and there are many who can draw to their recollection the meritorious performances across country of Jolly Tinker and Broadway Swell when carrying his black and gold jacket."

We have to record the death at Collingwood, Melbourne, Australia, of Mr. EDWARD J. A. YORSTON, M.R.C.V.S., which took place on the 5th November last, in the twenty-sixth year of his age. Mr. Yorston graduated so recently as July, 1880.

The death is also announced of S. L. RAGG, M.R.C.V.S., Sheffield, who graduated in 1875; as well as that of J. MARSHALL, M.R.C.V.S., Omagh, Ireland, a graduate of 1868.

Denmark has lost an excellent representative veterinarian by the death of Professor H. C. B. BENDZ, of the Copenhagen Veterinary School, at the age of seventy-six years. Bendz was an enthusiast in his profession; for though he graduated in surgery, in the Copenhagen University, in 1830, and served as a company surgeon, then as battalion surgeon in an infantry regiment, and graduated as a Doctor of Medicine in 1836, in 1837, he became a teacher in the Danish Veterinary School, and laboured for the remainder of his career in the ever-interesting field of veterinary science. So early as 1833, he attracted attention by his dissertation on Jacobson's Anastomosis and Arnold's Ganglion, which was translated from the Danish into several European languages. In 1847 he published a large work in two volumes on General Anatomy, and in 1853 a Handbook of Anatomy and Physiology of the domesticated animals. Several other scientific works were subsequently produced, and for these, as well as for his services to medicine in general, he received Russian, Swedish, and Danish honours. In 1853 he, in conjunction with Professor Bagge, edited the *Tidsskrift för Veterinär-Medicin*—a journal which has done good service in Denmark and Sweden, and is now so ably conducted by our worthy colleague, Professor Lindquist, of the Stockholm Veterinary School.

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Parliamentary Intelligence.

House of Commons, November 30th, 1882.

THE LOSS OF HORSES IN EGYPT.

SIR A. HAYTER, in reply to Mr. Brown, said that in consequence of the loss of horses during the Egyptian campaign, it had been thought advisable to take an additional sum for cavalry remounts. That sum had been included in the total amount mentioned by the Prime Minister in his statement. The Household Cavalry horses were now reported to be fit for duty. They had only lost thirty horses per squadron, or ninety in all. The Field Artillery horses were for the most part also fit for duty. The mortality among the horses with the regiments remaining in Egypt was not exceptional, and it was due to climatic causes.

Notes and News.

PRESENTATION.—On the occasion of the closing of active operations in connection with the stamping out of the Pictou Cattle Disease in Nova Scotia, Professor McEachran, the Veterinary Inspector in charge, was the recipient of a testimonial in the shape of a handsome Nova Scotia gold chain, accompanied by the following address, which was presented by Mr. George Caswell, on behalf of himself and fellow officers :—"To William McEachran, Esq., M.D., Veterinary Inspector, Pictou. Dear Sir,—On the closing of the operations in connection with the stamping out of the disease among the cattle of this county for this season, we, the undersigned officers employed under you in the work, beg to ask your acceptance of the accompanying chain as a small token of our esteem and regard for you personally, and also as an expression of our appreciation of the efficient manner in which you have conducted the measures for the stamping out of the disease. We would also express our thanks to you for the many acts of kindness and consideration shown to us personally by advice and assistance in the carrying out of our various duties, and would further testify of the uniform kindness and consideration with which you have dealt with the farmers and others with whom, in the discharge of what were often unpleasant duties, you have had to deal. Wishing you a safe journey homeward, and prosperity for the future, we beg to remain, yours sincerely, George Caswell, Joseph Grant, James Grant, John D. McQueen, Alexander Fraser, Lauchlin McInnis, Peter McInnis." Professor McEachran replied in suitable terms, thanking them for their handsome expression of good will. He said that while the active operations were for a time suspended, he thought that it was the intention of the Minister of Agriculture to recommence active operations early in the spring, and hoped that another season would see this country completely rid of the plague which threatened ruin to so many.

NEW VETERINARY SCHOOLS.—The Russian Government has instituted a new Veterinary School at Lemberg, Poland. Dr. Seifmann, of the Kazan Veterinary School, has been appointed Director, and Drs. Baranski and Kaydi, Professors.—In September last a Veterinary School was opened in connection with the Harvard University, United States, and Mr. Lyman, M.R.C.V.S., was appointed Director or Principal Professor. We believe it is intended to have a regular course of instruction for veterinary students extending to three years. The subsidiary branches to be studied will be taught in the other departments of the university, while every opportunity will be afforded for veterinary theoretical and practical instruction. Under the

supervision and direction of our friend Mr. Lyman, and with such an excellent connection, this new school should prove a certain success, and greatly benefit the country.

RABIES IN RADNORSHIRE.—There is at the present time a very serious outbreak of canine madness in part of the district between Knighton, Presteign, and New Radnor. It appears (writes Mr. R. Harding, of New Radnor, to the *Hereford Times*) that some two months since an unknown and unsuspected dog visited the district, and is now known to have bitten several others. No particular notice was taken of this at the time, until these animals in their turn became affected, and now there is distinct evidence of a more widespread outbreak than is generally supposed; indeed, it is impossible for some time yet to know what mischief has been done. It is within his personal knowledge that a heifer has certainly become affected with rabies, though she was not known to have been bitten; upon examination, however, the distinct mark of a bite is to be seen on the nostril. Within the last twenty-four hours two persons have gone to him—the one bitten by an affected dog, the other by one whose condition is not at present known. Both these persons were at work when the dogs came along, and, almost unknown to them, snapped them in the hand. A correspondent of the *Standard* says: "During the past few weeks no fewer than fifteen dogs have gone mad in the district of New Radnor, and large numbers of dogs have been bitten. A dog has just gone mad at Hanbor, one at the Vron, and one at Gladestrey; all have been killed. The magistrates have issued stringent orders, and the police are enforcing those orders to the utmost. Mr. Roberts, of Bodland, has lost five cattle worth £100, supposed to have been bitten by a mad dog. A farmer near New Radnor has suffered very heavily; it is said that he has already lost eight or nine valuable cattle. A number of dogs affected with rabies are known to be at large, while several that displayed symptoms of madness were destroyed last week. There is little abatement in the excitement produced in Radnorshire by this epizootic, and there is but faint hope of the dreadful malady diminishing at present.

ETIOLOGY OF GLANDERS.—In the Berlin Imperial Health Office investigations have been made into the etiology of Glanders, which have resulted in the discovery of the micro-organism of this disease. The newly-discovered organism was subjected to "pure" cultivation for a series of generations, after which the disease was produced in a horse by inoculation with the germ thus cultivated. The investigations were carried out under the direction of Dr. Loeffler and Professor Schütz, of the Berlin Veterinary School. The discovery is of immense importance.

Correspondence, etc.

PROFESSIONAL AMENITIES.

SIR,—I observe in the December number of the VETERINARY JOURNAL a letter by Mr. C. Cunningham, of Slateford, in which he says, with a sneer, in reference to some remarks of mine, that my humility and diffidence are scarcely worth notice. Now, that is probably Mr. Cunningham's method of refuting a proposition from which he dissents. It is not, however, mine, and if you will grant me sufficient space, I shall point out one or two of his most glaring inconsistencies.

He says: "I am not one of those who think that veterinary surgeons cannot examine veterinary students, even in such subjects as botany, chemistry and physiology." Then a few sentences farther on he adds: "I cannot but sympathize with the professors, when the successors of Professors Crum, Brown, and Turner, are an ex-lecturer from a rival school and a young Man-

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chester gentleman whose name in connection with physiology has never to my knowledge been heard of." Now, this last sentence is distinctly equivalent to the statement that no one should be appointed an examiner on any subject unless he is eminent in that subject; and that I cordially accept as a sound principle. But will Mr. Cunningham be good enough to furnish us with a list of veterinary surgeons eminent as chemists, physiologists, or botanists, from which we may select our examiners? He evidently believes that such exist, although neither Mr. Vaughan nor Mr. Taylor is one of the number. I am more or less familiar with the names of the eminent chemists and physiologists of our own country, and I have in vain tried to recollect among these the name of a member of our own profession. But since I read Mr. Cunningham's letter, I happened to refer to a recent volume of the Transactions of the Highland and Agricultural Society, and I there stumbled upon a possible explanation of the ground taken up by Mr. Cunningham. In the list given of the Society's Veterinary Examining Board, which recently terminated its functions, I find the following: "Physiology and Histology, C. Cunningham, Slateford." Truly Mr. Cunningham is endowed with much *humility*, and this is a striking exhibition of it. I hope that he will overcome his natural *diffidence* and inform us in what department of physiology *he* made his name famous.

Again, he says of modern veterinary students, that, with the exception of "*a few* bright, clever young fellows and *some* hard-working students," they are capable of improvement. Is this to be taken in its literal sense? and if so, has Mr. Cunningham attained in his own estimation that pinnacle of perfection where there is no room for further improvement? Or is it Mr. Cunningham's clumsy way of sneering at the average veterinary student? and does he mean that he is a creature very much inferior to what Mr. Cunningham was when he left the walls of his *Alma Mater?* That style of speaking and writing is too common at the present time, and generally comes most glibly from those who should be silent on the subject. I have known examiners of a breadth of professional and general education to which Mr. Cunningham has not a title of a claim express their astonishment at the professional knowledge acquired by veterinary students within so short a period; and after considerable experience as a student in University classes of more than one faculty, I believe that, for intelligence and industry, veterinary students of the present time need shrink from no comparison.

I heartily concur in Mr. Cunningham's denunciation of what he calls "*book-anatomists*," of which detestable class examples are sometimes thrust into the examiner's chair. But why does he inconsistently draw the line at anatomy? Is the sham not as execrable in chemistry or physiology? May Mr. Vaughan not be correctly described as a *paper* chemist, or Mr. Taylor as a *paper* physiologist? These gentlemen may, prior to each examination *cram* into their own brains a string of ill-digested questions and answers, but for them to pose as chemists or physiologists is beneath contempt.

Then Mr. Cunningham is much exercised because the new Examining Board for Scotland comprises no Scotch practitioners, and the grounds of his anxiety are, to say the least, ludicrous. He draws the picture of a student —the son or pupil of a Scotch practitioner—coming before his English examiner, to whom even the pupil's language is perhaps unintelligible. I suppose Mr. Cunningham thinks that our prelections at the Scotch colleges are delivered in the native dialect. Then he further paints the unfortunate pupil's rejection, because the peculiar methods of treatment that he has been taught are totally different to those followed beyond the Border. Surely this is the veriest drivel, and not worthy of a serious reply! Which of the Scotch colleges imparts instruction of this peculiar nature? Does he forget that the Principal of the London Veterinary College is a Scotsman and a Scotch

graduate, while the Principal of the Dick Veterinary College is an Eng'ishman and a graduate of the London School? Does he forget, moreover, that Scotch students form only a small proportion of those attending the Scotch college, and of these quite an insignificant number are sons or pupils of veterinary surgeons?

That Mr. Cunningham's complaint is justifiable most impartial men will admit, but on totally different grounds to those taken by him. If Scotch practitioners can be found of equal eminence with those from the sister country (and this is undeniable), then it was a most unreasonable slight to the former that they were passed over when a Scotch Examining Board was being appointed. The nationality of the Examiners is a matter of no concern to either students or teachers, but the unwarranted indignity will be a cause of irritation to Scotch veterinary surgeons, who might naturally enough aspire to the honour. Indeed, one does not need to read far beneath the surface of Mr. Cunningham's epistle to see that this is the true cause of his petulance. Viewed in this light, his attitude is most undignified, and proves him to be singularly destitute of that equanimity essential for the office which he covets.

I shall conclude in Mr. Cunningham's own words, by hoping that "you will excuse my trespassing so much on your space. If in my remarks I have hurt any one's feelings *undeservedly*, I am sorry for it."

I remain, yours, etc.,

JOHN MCFADYEAN.

Edinburgh Veterinary College,
12th December, 1882.

SIR,—The very peculiar nature of Mr. J. W. Hill's *reply* to my previous communication necessitates my asking space in the Journal to clear myself of supposed culpability.

Mr. Hill commences by saying that my critique was *unsolicited*, and was *a display of questionable taste;* now, I quite agree with Mr. Hill's first charge, for I never even hinted that I had been solicited to review his work; but having glanced over its contents, I thought myself quite justified in calling attention to what I considered most egregious errors; and I still maintain that I kept strictly to facts. As to the *questionable taste* which Mr. Hill fancies he discovers in my communication, I simply note that "that is merely a matter of taste," and, besides, the truth is at times the reverse of palatable. Mr. Hill will perhaps allow to me to ask if *he was solicited* to write the critique (on Dr. Crisp's article on Rachitis) which appeared from his pen in the *Veterinarian* for April last? The taste displayed in that critique must have appeared very questionable to Dr. Crisp.

Mr. Hill must be aware that his book was not published until the end of September last, and I have advertisements in my possession for two months *prior* to that, setting forth that the appendix was to contain "wood-cuts and coloured plates," so that Mr. Hill's assertion to the contrary is simply not true; and his wonderful (but quite unintelligible) *exposé* of myself falls to the ground, for the simple reason that I confined my concluding remarks to the work "as advertised." By the way, is Mr. Hill aware of the real meaning of the word *exposé?*

I am certainly much obliged and highly flattered with Mr. Hill's kind offer to become a subscriber for any work that I may issue on Bovine Pathology; but I beg to assure that gentleman that, if ever I do publish, I shall most unquestionably never have recourse to collecting subscriptions from people thirteen months before publication (*vide* Mr. Hill's advertisements). My cheque in payment of book was forwarded 25th August, 1881, and I received the book (immediately on its publication) 29th September, 1882.

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Mr. Hill's puerile offer to return my money is altogether beneath any notice, being quite a refreshing example of very questionable taste!

Having thus far premised, I will now embrace the opportunity of offering a few more *notes* on Mr. Hill's *magnum opus*—"Bovine Medicine and Surgery." And first of all I note that it is pre-eminently a "book of extracts," fully three-fourths of its contents being copied from other writers on analagous subjects; there are extracts extending from a few lines up to ten whole consecutive pages, and of these lengthy extracts there are a great many! Now, it is no doubt a bad thing to depend entirely on one's own ideas, but without doubt it is equally as bad, if not worse, to publish such a work as that under review with scarcely one-fourth of original matter in it! With what relish can any one open even a handsome volume only to find it full of compilations from other works already perused? And not only this, but some of the extracts are actually repeated word for word, as, for example, an extract from *Rainard* which will be found exactly similar at pages 315 and 340. There are also between twenty and thirty of the articles on various subjects composed entirely of extracts from other writers, without a single original idea or observation from the author. So much for Mr. Hill's (original) literary abilities, anent which I may observe that compilation and originality are generally acknowledged to have some slight difference!

In Mr. Hill's preface I find that—"Information derived from the shrewd unprofessional observer often assists the professional attendant." The truth of this original observation will be but too obvious to any one who may glance at the numerous formulæ given in our author's pages, where *English* and *Latin of every description* are thrown together in such a way as would confound any common dispensing chemist; such prescriptions are a disgrace to our profession, and only tend to render us ridiculous in the eyes of the dispensing druggist; in fact, they plainly bear the impress of owing their origin to unprofessional observation and ability (?). If Mr. Hill cannot overcome the mystery of Latin case-endings, he ought to write out his prescriptions wholly in good old English. If I mistake not, Mr. Harold Leeney, M.R.C.V.S., Brighton, in the *Veterinarian* for December, 1880, drew attention to a similar error in the prescriptions in Mr. Hill's "Diseases of the Dog;" but Mr. Leeney's hint seems to have fallen on ears deaf to any sort of friendly advice or instruction. "Where ignorance is bliss 'tis folly to be wise!"

The composition of several of Mr. Hill's prescriptions also savours just a little too much of the unprofessional nostrums once so common in the days of the defunct cow-leech: reference to our author's pages will prove the truth of what I say.—Yours, etc.,

A. E. MACGILLIVRAY.

Banff, N.B.

SIR,—Will you allow me, as a veterinary student, to make a few remarks on a recent publication which has been offered to us as a text-book on Cattle Pathology, and against which, seeing that it is utterly unfit for the position claimed for it, I consider we have a grievance? I refer to "Hill's Bovine Medicine and Surgery." About Mr. Hill's manner of writing, it would, perhaps, be unbecoming in me to speak; yet I cannot help pointing out that such a crude and involved style as is evidenced by the following quotations, is hard to parallel in any work claiming to be a scientific treatise.

Page 264. "Treatment, if adopted, would, if arising from inflammatory action, be antiphlogistic."

Page 427. "If custom is to decide such cases, it is but of little use having a Society for the Prevention of Cruelty to Animals—a society whose aim it is to protect from unmerciful hands some of the noblest works of creation, and one which England has justly cause to be proud of."

Page 594 (speaking of Torsion in Castration). "The testicle being exposed, and the cord and vessels embraced in the steel clams, the latter are grasped in the torsion forceps and maintained with a screw."

These three quotations, which were taken at random, require, I think, no comment. The author speaks of his "experience in morbid anatomy and inferentially of his capabilities as an anatomist and comparative anatomist." I shall endeavour to show that if a student at the examination table displayed such a plentiful lack of knowledge of these subjects, as is indicated in the volume under consideration, he would most assuredly be relegated to his studies for further instruction.

First, then, with regard to morbid anatomy. On page 21 we read that in the third stage in Pneumonia "Suppuration commences—in other words, the lung-structure breaks down." I have been taught that in this stage, instead of the lung structure breaking down, the exudate breaks up.

Page 23 contains the extraordinary announcement that "Contagious Pleuro-pneumonia is a sub-acute disease, having its location in the interlobular exudation of lymph."

Opposite page 32 is a plate to show the lesion in Pleuro-pneumonia. A wedge-shaped piece of lung is represented, and in the thickened interlobular tissue are scattered objects, like red corpuscles, the meaning of which I hope is quite evident to other readers; to me I confess they convey no meaning, and there is no explanation given in the text. This plate and some others in the book are marked "original," which I take it is quite an unnecessary care.

On page 32 a statement is made, which is repeated in the chapter on meat inspection, that the marbled appearance of the lung is altogether peculiar to Pleuro-pneumonia. I submit that in Sporadic Pneumonia in the ox a similar marbled appearance is seen.

Here is a unique sentence from page 33 (still alluding to Pleuro-pneumonia): "Bands of white fibrin of various degrees stretch in every direction; in other words, there is interlobular exudation or effusion of albumen or fibrin, separated from the colouring matter of the blood, into the connective areolar tissue of the pulmonary lobules, which are themselves compressed or hepatized." Shade of John Hunter, how may this be interpreted?

The 205th page states that "Determination of blood to a part results in stagnation or gathering together of the corpuscles."

Certainly the affluxus sanguinus, or determination of blood, may lead to stasis, if it be followed by inflammation, but I hope that this "determination" is not always attended by such serious consequences, or alas for beauty's blush!

On page 250 we are informed that to examine urine for albumen, we are to use the microscope, and to observe cylindrical or tube-like bodies (coagulated albumen); the following necessary caution being added: "At the same time, in examining urine for the presence of albumen, it must be borne in mind that its discovery and apparent quantity will depend upon existing circumstances." Quite so.

On page 281 the urine is said to be "of a high temperature in Gonorrhœa."

Perhaps the most extraordinary statement in this extraordinary book occurs on page 408, where the author says that a medical man, a friend of his, had expressed the opinion that "there was no such thing as Milk Fever, that the disease so termed was caused by a small portion of placental membrane being conveyed through the circulation and *deposited on* the brain." The author adds that "this theory, however, has not been practically demonstrated." That doctor was a funny man.

On page 464, and again on page 465, in describing the symptoms of

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Ophthalmia, it is stated that "the cornea is traversed with engorged blood-vessels." This in a non-vascular structure is, to say the least of it, remarkable.

I was unaware, till I read it on page 554, that the ox was susceptible of inoculation by the Glanders poison, and that when the disease was contracted by the large ruminant, symptoms were presented similar to those seen in the horse. Pus, on page 554, is explained to be "a quantity of matter, the result of dead, disintegrated, and dissolved textures."

In a lucid arrangement of tumours which appears on page 557, Sarcomata are classed as non-malignant growths.

Perhaps I have said enough to indicate what "my experience of morbid anatomy" warrants the author in putting in a work designed as a text-book for the veterinary profession.

A few quotations having reference to the knowledge of anatomy displayed, and I have done.

Chapter III. commences with a description of the ox's heart, and a view is given of that organ with the principal blood-vessels, and in spite of the fact that the anterior aorta is absent in the ox, we have a large one present in the drawing. On page 119 we read that, among others, the "arteries most frequently injured are the metacarpal branches of *the femoral*, or gluteal, and the metatarsal."

The vulva of the cow is described on page 321 as having "a superior commissure, which is very acute, and an inferior commissure, which is more rounded and obtuse; it lodges the clitoris."

The haw, it is explained on page 472, is a "fold of membrane." Most people are agreed that its composition is fibro-cartilage, covered by the conjunctiva; in another place the haw is said to be extravasated and the conjunctiva injected.

On page 505 a very curious mistake occurs. A drawing of the hind-quarters of a calf is taken from Cobbold. In the original a muscle is represented which, from its attachments, can be no other than the triceps abductor femoris, but is called by mistake the vastus externus. Our author has copied drawing and mistake—the muscle is vastus externus still.

A description of Mumps appears on page 562, and the statement is made that the disease "consists of inflammation of the parotid gland, the salivary glands being frequently involved." I wonder what the author considers the function of the parotid to be.

Considering how little original matter is contained in this volume (out of twenty-six and a half pages on Pleuro-pneumonia, for instance, about twenty-one are copied from other authors), I think the inaccuracies, not to say egregious blunders, of which the author has been guilty render this treatise quite unworthy of our support, and, indeed, its perusal might make us regret that such a volume could emanate from a Fellow of the Royal College of Veterinary Surgeons.—I am, yours,

Edinburgh, *Dec.* 11, 1882. A STUDENT.

THE BOARD OF EXAMINERS.—AN ANSWER TO MR. C. CUNNINGHAM.

DEAR SIR,—I, for one, look upon the communication from Mr. Cunningham on the above subject, in last month's Journal, as a gross insult to the lately-elected Board of Examiners, and also to the Council of the R.C.V.S.

If Mr. C. had been elected, I suppose everything would have been right—in his estimation, at least; but on what grounds he expected to be I utterly fail to see. Has any one ever heard of his name in connection with chemistry, toxicology, or anatomy? I think very few ever heard of it at all before he wrote the sarcastic article in question.

In the fifth section of his communication, he says :—"If I had the honour of being an examiner in horse or cattle practice, and a student were to tell me that he would use as many drugs as some practitioners use, that his shelves would groan under a load of bottles, drinks, and balls, that daily and almost hourly doses would be his rule [would any student be such a fool as to tell an examiner such a thing?], and hand me a certificate condemning a horse for every trifling ailment or blemish, with or without the real cause of unsoundness inscribed thereon, I candidly confess I would reject that student." Did he ever hear of an examiner who would not?

Then he goes on to say :- "Such things may suit other parts; we don't wish them here; and where is our examiner to prevent it?" By this he seems to imply that the examiners in Class C.—viz., Messrs. Pritchard and Cox on the horse, and Messrs. Duguid and Gresswell on cattle examination—are totally unfit for the part they are to fill. Allow me to tell Mr. C. that the above-mentioned gentlemen are more esteemed by the majority of the profession than he ever was, or ever will be. After all this, Mr. C. says he is pleased with the appointment of two of the Board of Examiners, viz., Mr. G. Fleming and Mr. Cox. The latter, he seems to forget, is one of the four examiners, "It is sickening (to use his own words) for him to think of."

Some men seem to think that by sending a report of nearly every case they have to the VETERINARY JOURNAL and *Veterinarian*, they will raise themselves in the eyes of their professional brethren sufficiently to be elected on the Board of Examiners; and when they find out their mistake, they insult those who are elected. And I notice one of them, in his blind rage, sneers at one of the examiners, who is (to use the words of Mr. Hill), "the brightest literary star our profession contains;" and, I may add, the man who has done more for our profession than any one ever did before.

In conclusion, I think such a list of well-known men for our Board of Examiners—some of them of almost world-wide reputation—should be a sufficient guarantee of its efficiency, and that no unprejudiced man could find fault with the selection our Council have made.—I am, dear sir, yours faithfully,

A COUNTRY PRACTITIONER.

THE FLEMING TESTIMONIAL.

DEAR SIR,—As the Committee are desirous of closing the subscription list of this fund at an early date, and as they are anxious that every member of the profession should have an opportunity of contributing to such a laudable object, they beg to bring it to notice, and to solicit favourable assent by forwarding subscriptions to the Hon. Treasurer, H. J. Cartwright, F.R.C.V.S., Wolverhampton, as soon as convenient.

The very strong claims Mr. Fleming has upon the profession, should render it a pleasure to us to show that we are not oblivious of his great services, nor ungrateful for the many benefits he has conferred.—I beg to remain, yours truly,

J. B. MARTIN, *Hon. Secretary.*

60, High Street, Rochester, Kent.

PRIZE FOR ESSAY ON AFRICAN HORSES.

DEAR SIR,—Being very much interested in the horses of Africa, I am anxious to give a prize (small gold medal) for the most practical essay on the horses of that country.

Therefore may I ask you to insert as above in your valuable Journal? The reports of competitors to be sent to me at Roorkee, N.W.P., India, by 31st March next.—I am, sir, yours truly,

P. RODDY, *Lieut.-Col., Bengal Army.*

Roorkee, 13*th November*, 1882.

XUM

"EXISTING PRACTITIONERS."

DEAR SIR,—I think I am correct in saying that about *nineteen-twentieths* of the large number of persons who have applied to be registered as "Existing Practitioners" reside out of London. It therefore seems somewhat singular that on the Registration Committee of the Council (appointed to investigate the claims of the various applicants), there is only one country M.R.C.V.S., Mr. Cartwright, the other members being two military men, a professor, an ex-professor, and five metropolitan practitioners.

There can be no doubt whatever but that many persons have applied to be registered who have no legal right, and how a central committee, sitting in London, will manage to properly investigate the claims from all parts of the three kingdoms is, I must confess, a puzzle to me.

If not too late, I would suggest that the Council should appoint several local sub-committees in various districts, who could take evidence, *viva voce* if necessary, and thoroughly sift the pretensions of those persons who have applied to be registered. These sub-committees could then report to the Council, and by this mode of proceeding I am convinced a number of impostors will be kept off the register of "Existing Practitioners."

I am, sir, yours truly,

"HIBERNIA."

TO CORRESPONDENTS.

J. F. W.—It is probable that the Council of the Royal College of Veterinary Surgeons will soon have decided as to who of those who have applied for registration as "Existing Practitioners" are to be registered. We do not know if it is intended to grant certificates, as the College cannot certify to anything more than the fact that these persons are registered, in order to protect them from the penal operation of the Act; and this the Register itself will do.

The Proceedings of the Scottish Metropolitan Association will appear next month.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from J. J. Meyrick, C.B., Cairo; Colonel Roddy, Roorkee, India; A. Metherell, Brighton; J. McFadyean, Edinburgh; A. Bain, Liverpool; A. Broad, London; W. A. Edgar, Dartford; R. Rutherford, Edinburgh; A. E. Macgillivray, Banff; J. F. Watson, Glasgow; W. R. Davis, Edinburgh; H. R. Bradshaw, Portrush; "A Student"; "A Country Practitioner"; L. E. Wheat, Ontario; J. Blakeway, Stourbridge; W. Broughton, Leeds; "Hibernia"; H. Rossignol, Melun, France.

BOOKS AND PAMPHLETS: *C. Cameron, M.D.*, Microbes in Fermentation, Putrefaction, and Disease; *Ch. Siegen*, Bericht über die Pasteur 'sche Impfung gegen Milzbrand in Herve; *M. G. Chenier*, La Question d'Identitie de la Morve et du Farcin; *C. Bäumler*, Der Sogen. Animalische Magnetismus od. Hypnotismus; *C. Hueter*, Grundriss der Allgemeinen und Speciellen Chirurgie.

JOURNALS, etc.—*Zeitschrift für Vergleichende Augenheilkunde; Lancet; Recueil de Méd. Vétérinaire; Annales de Méd. Vétérinaire; La Presse Vétérinaire; Wochenschrift für Thierheilkunde und Viehzucht; Der Thierarzt; American Veterinary Review; Echo Vétérinaire; Australian Veterinary Journal; Medical Press and Circular; Chicago Live Stock Journal; Journal de Méd. Vétérinaire et de Zootechnie; Live Stock Journal; Nature; Revue Vétérinaire; Archives Vétérinaire; Edinburgh Med. Journal; Tidskrift för Veterinar-Medicin; La Clinica Veterinaria; Medical Times; Journal of Anatomy and Physiology; Breeder's Gazette; Field, Forest, and Stream; Journal of Comparative Medicine and Surgery.*

NEWSPAPERS.—*Oxford Times; Picton Colonial Standard; Dublin Evening Telegraph; York Herald; Cork Constitution; Lincolnshire Chronicle; Manchester Guardian.*

THE

VETERINARY JOURNAL

AND

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EDITED BY

GEORGE FLEMING, F.R.C.V.S.,

Inspecting Veterinary Surgeon, Army Veterinary Department.

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